December 2022 version

Environmental Assessment Worksheet

This most recent Environmental Assessment Worksheet (EAW) form and guidance documents are available at the Environmental Quality Board's website at**:** https://www.eqb.state.mn.us**/** The EAW form provides information about a project that may have the potential for significant environmental effects. Guidance documents provide additional detail and links to resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item or can be addressed collectively under EAW Item 21.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. **Project title:** Mud Lake Habitat Restoration

2. **Proposer:** MN Department of Natural Resources

Contact person: Ben Nicklay
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3. **RGU:** MN Department of Natural Resources

Contact person: Caroline Oswald
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4. **Reason for EAW Preparation:** (check one)

Required:
☐ EIS Scoping
☒ Mandatory EAW

Discretionary:
☐ Citizen petition
☐ RGU discretion
☐ Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

Minnesota Rules, part 4410.4300 subpart 27, item A: Wetlands and Public Waters.

5. **Project Location:**

- County: St. Louis
- City/Township: City of Duluth
- PLS Location (¼, ¼, Section, Township, Range): SW ¼, Sec. 2, & NW ¼, Sec. 11, T48N, R15W
- Watershed (81 major watershed scale): St. Louis River, AUID 04010201-533
- GPS Coordinates: 46°39'47"N 92°12'38"W
- Tax Parcel Number: 010-3160-00460, 010-2730-00150, 010-2730-00140, 010-3160, 01830, 010-3160-00510, 010-2730-00130, 010-3160-04170, 010-3160-03460, 010-3160-03970, 010-3160-03770, 010-2730-00100, 010-0020-00010, 010-3160-00490, 010-2730-00050, 010-2730-00120, 010-3160-00440, 010-2730-01230, 010-3160-00505, 010-2730-01231, 010-2730-00110, 010-0020-00020

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project;

Attachment 1: Figure 1. Project Location

- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and

Attachment 1: Figure 2. Topographic Map

- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

Attachment 2: Project Designs

- List of data sources, models, and other resources (from the Item-by-Item Guidance: *Climate Adaptation and Resilience* or other) used for information about current Minnesota climate trends and how climate change is anticipated to affect the general location of the project during the life of the project (as detailed below in item 7. Climate Adaptation and Resilience).

DNR's MN Climate Trends Map
Minnesota Climate Projections (Coupled Model Intercomparison Project phase 5 (CMIP5))

Additional Figures om Attachment 1:
Figure 3: Project Components
Figure 4: Local Geography

Attachment 3:
Wetland Delineation Report

6. Project Description:

a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

The Minnesota Department of Natural Resources proposes to create a new channel, deep water habitat, hemi marsh, and coastal marsh, remove a derelict concrete structure, and install a new 50-foot bridge at Mud Lake within the St. Louis River Estuary. The proposed Project aims to restore the hydrology and habitat at Mud Lake and is part of a collaborative effort under the Great Lakes Area of Concern Program.

b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities

The proposed Mud Lake Restoration Project (Project) would restore aquatic and wetland habitat in the St. Louis River Estuary (SLRE), a waterbody designated by the DNR as a resource of Outstanding Biological Significance and located within the St. Louis River Area of Concern (SLRAOC). The SLRAOC is one of 43 Great Lakes Areas of Concern designated in 1987 by the

International Joint Commission under the "Great Lakes Water Quality Annex I and Great Lakes Restoration Initiative Action Plan II Priority – Cleaning up a Great Lakes Areas of Concern" agreement between the United States and Canada. Historical actions such as improper municipal and industrial waste disposal and unchecked land use practices, including dredging and filling of aquatic habitat and damaging logging practices, contributed to the complex set of issues facing the SLRAOC at the time it was listed.

The proposed Project has been identified as an action required to mitigate legacy environmental degradation, restore beneficial uses, and delist the SLRAOC (as described more comprehensively in Section 6D, 6E, and 6F).

Construction is anticipated to begin in summer 2025 and would be complete by the end of 2026. Construction timing and phasing would be determined by the contractor (contract not yet awarded) within the requirements and specifications of the contract, permits, and landowner access agreements. The proposed Project construction would occur over two seasons due to complexities involving site access and staging, as well as seasonal construction restrictions due to winter ice cover and the fish spawning exclusion from April 1-June 30. The proposed Project includes several components that would improve hydrologic connectivity, reestablish deep-water habitat, reduce hybrid/narrowleaf cattail monoculture, and restore/enhance critically imperiled coastal wetland habitat:

- Installation of a 50-foot bridge through the railroad causeway
- Dredging of approximately 100,500 cubic yards of sediments to create a new channel, deep water habitat, and hemi-marsh
- Removal of a derelict concrete structure
- Creation of 3 acres of coastal march reusing dredged material
- Reuse/disposal of excess dredge material

Detailed Site Description

Mud Lake is a 120-acre shallow sheltered bay of the St. Louis River located near the Gary New Duluth neighborhood of Duluth, Minnesota. The average depth of the open water area is approximately 2.4 feet, and the maximum depth is 10.3 feet. The proposed Project area includes the surrounding wetlands and some of Steelton Bay to the northeast, for a total of 280 acres (Attachment 1: Figure 2 and Figure 4).

Mud Lake is not ecologically a lake feature, rather it is a backwater slough that has historically been connected to the St. Louis River. The emergent wetlands around the fringes of Mud Lake are primarily a monoculture of hybrid/narrowleaf cattail with pockets of bur-reed marsh, water lily shallow marsh, and mixed macrophyte hemi-marsh. Mud Lake was bisected by a railroad grade in the 1840's artificially separating west Mud Lake from the St. Louis River. A 70-foot bridge is currently the only connectivity between the two water bodies. The exchange of water, sediment, and nutrients is limited by the causeway, impacting the water residence time, dissolved oxygen levels, and habitat conditions in west Mud Lake. Additionally, west Mud Lake has areas of contaminated sediments that will be discussed in more detail in later sections of this document.

Habitat Components (herein called Restoration Units (RU)) (Attachment 1: Figure 3)

RU1: New Bridge
A 50-foot bridge would be installed near the northern end of the railroad causeway. It would be a simple span steel girder bridge with an open deck, similar to the existing bridge near the

southern end of the causeway. This component would require excavation and disposal of the causeway material, supports driven 100 feet deep due to the sediment's characteristics present on site, and construction of the bridge. Equipment needed would include barges, excavators, and a crane. The new bridge would align with the new channel (RU2) to improve flow volume and reduce residence time in west Mud Lake. The existing bridge would be retained and not altered by the Proposed Project.

RU2: New Channel

A 3,900-foot-long channel (6 acres) would be dredged to connect the open water in west Mud Lake with the St. Louis River channel east of the new bridge (RU1) in the railroad causeway. It would be 55 feet wide with tiered depths. Shelves on both sides would be 10 feet wide and 3 feet deep, with the middle being 20 feet wide and 5 feet deep. The transitions between the main channel, benches, and existing ground would be at a 1:3 slope (meaning one foot of vertical change for every three feet of horizontal change). The dredge tolerances in this area would be generous, allowing material to settle at its angle of repose. The total dredge quantity for RU2 would be 35,000 cubic yards. However, the dredge footprint overlaps with contaminated sediments that would have to be dredged, dewatered, and disposed of separately from the majority of the dredge material that has no restrictions on reuse. The total quantity that would have contaminants is approximately 4,100 cubic yards. See Sections 11b and 13a for characterization of contaminants.

Emergent vegetation is planned on the shelves, while the deeper middle would support submerged vegetation and discourage recolonization of hybrid/narrowleaf cattails. Native plants would be seeded utilizing MN Department of Transportation seed mixes, and the use of plugs would also be considered; although, a planting plan has not yet been finalized. The channel would allow for better exchange of water, dissolved oxygen, nutrients, and sediments between the water bodies. This feature has several additional benefits, including it:

- reduces the acreage of monoculture narrowleaf/hybrid cattails;
- diversifies habitat for waterfowl, secretive marsh birds, and other migratory birds; and
- increases the diversity of habitat available for different life stages of fish.

RU3: Deep Water

In east Mud Lake, 5 acres would be dredged to a depth of ten feet to diversify fish habitat away from the main river channel and to create fish overwintering habitat. This component would be accomplished by removing 40,000 cubic yards of material from an area that currently has depths ranging from three to six feet. A channel to connect the deep water to the St. Louis River channel would also be dredged to ten feet. The connecting channel would support increased access for aquatic organisms and hydrologic exchange with East and West Mud Lake. This component restores deep water habitat lost elsewhere in the SLRE and Mud Lake depths as shown on historical maps.

RU4: Hemi-marsh

Hemi-marsh enhances interspersion of open water and emergent vegetation to improve marsh bird nesting and rearing conditions as well as fish spawning and nursery habitat. Existing hybrid/narrowleaf cattail mats would be excavated to create a connecting series of potholes to provide shoreline complexity and greater interspersion. Potholes with irregular shapes would be excavated to about 0.1-0.25 acres in size and to a depth of four feet. Narrower connecting channels would be excavated between the potholes (see Attachment 2: Sheets C-302 and Sheet C-303). Excavated cattails and soils would primarily be placed in "habitat mounds" at least 15-feet distant from the potholes and to a height less than the ordinary high-water level (OHWL); however, excess material would either be beneficially reused for the coastal marsh component or transported offsite.

A 10-foot buffer zone would be established around each hemi-marsh excavation area and habitat mound, in which the contractor would seed native plants. This buffer zone would also have ongoing maintenance for management/control of invasive plants. The proposed Project includes three new areas of hemi-marsh totaling 6.5 acres. The total dredge quantity for the hemi-marsh areas is 25,500 cubic yards. An amphibious excavator is typically used to construct hemi-marsh features.

RU5: Coastal Marsh

Three acres of new coastal marsh would be created by placing 15,000 cubic yards of dredged material along the southeast side of the railroad causeway. This area is designed to provide habitat with water depths ranging from 0.5 feet to 5 feet, with an average depth around 2 to 2.5 feet. The dredge material would be sourced from the deep-water and hemi-marsh RU's. Native emergent vegetation would be planted and seeded in the area to discourage colonization by hybrid/narrowleaf cattail or other invasive plants. The goal is to create Lake Superior Coastal Marsh, an imperiled plant community in Minnesota. This component would beneficially reuse dredge material and soften 850 feet of the railroad causeway rip rap, diversifying plant, bird, and fish habitat.

RU6: Infrastructure Removal

The proposed Project would remove a derelict concrete and iron pipe structure that extends 825 feet from the southwestern shore to the railroad causeway. At one time, the structure served as the outfall for a water treatment plant in the area. It has been abandoned for decades but continues to inhibit natural hydrologic processes and aquatic organism passage in the southwest corner of Mud Lake. The structure would be demolished, removed, and discarded at an approved local landfill.

Proposed Project Activities

Proposed Project Site Preparation

The contractor would construct a temporary sediment dewatering pad and staging area just west of Mud Lake within the proposed Project area, owned by U.S. Steel. It would include a temporary water treatment plant to collect and treat stormwater and wastewater generated from the contaminated sediment before the wastewater is returned to Mud Lake. The site was selected because it was previously used as a dewatering pad and had stored dredge material through 2023. Its reuse for the proposed Project would minimize additional impacts to wetlands or other upland areas, reduce noise and construction traffic that could otherwise negatively impact residential areas, and lower the greenhouse gas emissions than if a more distant site was used.

The contractor would also construct temporary access to Mud Lake. Two options are being explored. The north option would include grading up to 500 feet of temporary road to reach Mud Lake from existing roads on U.S. Steel property. This would include clearing trees along the road corridor. The southern access route would utilize city streets and the access road along the Canadian National Railroad (CN) tracks to transport equipment and dredge material to the dewatering facility. This option does not include any tree clearing. However, both access options would include the construction of a temporary half-acre staging pad and dredged channel within the emergent wetlands surrounding Mud Lake. The staging pad and dredged channel would allow the contractor to mobilize and deploy their equipment to the open water and dredge areas within west Mud Lake.

Sediment Dredging and Transport

The contractor would dredge the sediments in 2025 and 2026 and may choose to remove the

sediment by either hydraulic or mechanical methods (or a combination of the two). The contractor would isolate the dredge area during construction using a combination of steel sheet piling and silt curtains. They would monitor turbidity levels with appropriate best management practices (BMPs) during construction.

Mechanical dredging can be accomplished in two ways. In the first, the contractor would excavate the dredged sediment and screen it for debris prior to depositing it into a transfer box where it would mix with water pumped from the St. Louis River to form a slurry that is fluid enough for transport through a high-density polyethylene (HDPE) pipeline. The contractor may use booster pumps along the pipeline to maintain adequate flow. The contractor is required to visually inspect and monitor the pipeline pressure to ensure the pipeline integrity is maintained. The pipeline would transfer the slurry to the dewatering pad where an injection unit would dose the slurry with polymers to aid in flocculation of the fine-grained sediment prior to discharging the slurry into Geotubes® for passive dewatering. The second method involves transporting the material to the dewatering facility by truck before screening it, adding water, and pumping into Geotubes® for passive dewatering. For hydraulic dredging, the material is dredged as a slurry and can immediately be pumped as a slurry. If the contractor uses barges for sediment transport, the DNR requires adequately sized barges, free from defects, and are watertight. For material requiring transport by truck, effective measures would be implemented to eliminate spillage of material.

Sediment Dewatering

The contractor would process 60,100 cubic yards of sediment and cattail material from the proposed Project at the 11-acre dewatering area on U.S. Steel property. The dewatering pad design includes a drainage layer over a geomembrane liner with containment berms to collect stormwater and effluent water draining from the sediments. It would be divided into three segments: one for the 4,100 cubic yards of contaminated sediment, one for the 56,000 cubic yards of clean sediment, and the third to handle cattail and other vegetation material. The contractor would position empty Geotubes® on the dewatering pad and then fill the Geotubes® by inserting a dredge discharge pipe into ports located at the top of each Geotube®. The contractor would also place the dredge-screening tank, polymer injection unit, and water treatment units within the dewatering pad area.

The contractor would hydraulically pump the dredged sediment slurry to the dewatering pad area, screen out vegetation debris, and add polymers to the Geotubes® to increase flocculation of fine-grained sediment inside the Geotubes®. Effluent water would drain from the Geotubes® through the fabric to dewater the sediment and reduce the volume and weight of the contained materials. The dewatered solids would remain in Geotubes® to further consolidate the material. When the dewatering is complete, the contractor would remove the Geotubes® filled with the dewatered sediment and dispose of the contaminated material at an approved landfill and transport clean material to locations where it can be beneficially reused. The contractor would determine the reuse locations and be responsible for transporting the material.

Discharge Water Treatment

The contractor would treat the effluent collected from the Geotubes® containing contaminated dredge material in a temporary water treatment plant covered by a Minnesota Pollution Control Agency (MPCA) National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater General Permit. Drainage from the cattail material and Geotubes® containing uncontaminated dredged material would not need to be treated. The contractor would develop a work plan for the water treatment plant that the MPCA and DNR would review. The contractor would discharge the effluent directly back to west Mud Lake following treatment through the on-site water treatment plant. The contractor would treat the

water to meet Water Quality (WQ) standards and WQ criteria set by the MPCA for all contaminants of concern (COC), as well as other treatment limits set by other local, state, or federal agencies. The contractor is responsible for all aspects of the on-site water treatment plant, including verifying the design parameters, and the installation, maintenance, and removal of the water collection, storage, and treatment infrastructure.

c. Project magnitude:

Description	Number
Total Project Acreage	280
Total Disturbed Acreage	30
Linear project length	NA
Number and type of residential units	NA
Residential building area (in square feet)	NA
Commercial building area (in square feet)	NA
Industrial building area (in square feet)	NA
Institutional building area (in square feet)	NA
Other uses – specify (in square feet)	NA
Structure height(s)	NA

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

Purpose

The proposed Project's purpose is to improve fish and wildlife habitat at Mud Lake in support of removing Beneficial Use Impairment (BUI) 9, Loss of Fish and Wildlife Habitat from the SLRAOC, which is addressed in Remedial Action Plans (RAPs) prepared by the AOC Coordinator Team (the Fond du Lac Band of Lake Superior Chippewa, the DNR, the MPCA, and the Wisconsin Department of Natural Resources (WDNR)). Versions of the RAP are available on the MPCA's website[1]. The proposed Project addresses physical habitat loss as identified in the RAP (Fond du Lac Band of Lake Superior Chippewa, DNR, MPCA, WDNR 2020).

Need

The proposed Project addresses system-wide impairments within the SLRAOC. Throughout the estuary, shallow sheltered bay and deep-water habitat has been physically lost to development and degraded by past industrial uses. The 2023 RAP (Fond du Lac Band of Lake Superior Chippewa, DNR, MPCA, WDNR 2023) identifies a historic loss of 3,400 acres of wetland and aquatic habitat in the estuary. Specific to Mud Lake, the railroad causeway increases the residence time of water in west Mud Lake and impacts the flow of water, nutrients, sediments, and organisms between West Mud Lake and the St. Louis River channel. The site also contains large stands of hybrid/narrowleaf cattails and lacks a substantial deep-water component.

Beneficiaries

Proposed Project beneficiaries would be fish and wildlife species whose habitats would be improved through the proposed Project's actions. The proposed Project would also benefit human health and enjoyment through improved fishing potential, birding, and aesthetics. As a result, the people of Minnesota and Wisconsin who live and recreate in the area would also be beneficiaries of the habitat improvements achieved at Mud Lake and throughout the SLRAOC.

[1] St. Louis River Area of Concern resources | Minnesota Pollution Control Agency (state.mn.us)

e. Are future stages of this development including development on any other property planned or likely to happen? ☒ Yes ☐ No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

The RAP identifies the proposed Mud Lake Project as Action Number 9.08, part of the SLRAOC restoration work targeting BUI 9: Loss of Fish and Wildlife. Table 1 lists the required remediation and restoration work associated with the SLRAOC process. These activities collectively comprise the 1,700-acre habitat restoration target associated with BUI 9.

Table 1. Ongoing and future phases of SLRAOC remediation and restoration work (as of November 2024).

RAP Action No.	State	Project Name	Project Description	Status
9.12	WI (WI DNR)	Crawford Creek Habitat Restoration	Remediate contaminated sediments and restore habitat within stream, wetland, and floodplain.	In progress

f. Is this project a subsequent stage of an earlier project? ☒ Yes ☐ No
If yes, briefly describe the past development, timeline and any past environmental review.

Actions required to remove nine BUIs and delist the SLRAOC are described and updated annually in the SLRAOC RAP (Fond du Lac, MPCA, DNR, and WDNR 2020). To date, 17 SLRAOC remediation and restoration projects have been completed, or are under construction (see Table 2). The activities in Table 2 contribute significantly to the 1,700-acre habitat restoration target associated with BUI 9: Loss of Fish and Wildlife Habitat. These projects have all gone through environmental review as phased actions.

Table 2. Completed and under construction phases of SLRAOC BUI 9 remediation and restoration work (as of November 2024).

RAP Action No.	State	Project Name	Project Description	Status
9.01	MN	Spirit Lake	Remediate contaminated sediments and restore emergent wetlands.	Complete
9.02	MN	40th Avenue West R2R Project	Remediate contaminated sediments and restore habitat.	Complete
9.03	MN	Radio Tower Bay	Remove non-native material and restore optimum bathymetry.	Complete
9.04	MN	Grassy Point Restoration	Remove non-native material and restore optimum bathymetry.	Complete
9.05	MN	21st Avenue West R2R Project	Remediate contaminated sediments and restore habitat.	Complete

RAP Action No.	State	Project Name	Project Description	Status
9.06	MN	Kingsbury Bay Restoration	Restore wetland complex at the mouth of Kingsbury Creek to pre-1961 condition.	Complete
9.07	MN	Knowlton Creek Watershed Project	Reduce runoff and sediment transport within watershed and restore cold-water stream habitat.	Complete
9.09	MN	Perch Lake	Remediate contaminated sediments, establish more vital hydrologic connection, and restore wetland habitat including wild rice; establish deep water.	Under construction
9.10	MN	Chambers Grove Park	Soften and restore shoreline in City of Duluth Park. Create sturgeon spawning habitat in river channel.	Complete
9.11	WI	Allouez Bay	Vegetation restoration including removal of AIS and re-establishment of wild rice. Upstream sediment control outreach.	Under construction
9.14	WI	Pickle Pond	Habitat enhancement and sediment remediation as warranted by remediation to restoration evaluation.	Complete
9.15	WI	Wisconsin Point Dune Restoration	Development of appropriate public access infrastructure to protect dunes and conduct dune restoration and invasive species control.	Complete
9.16	WI	Hog Island	Nesting area enhancement, habitat restoration.	Complete
9.17	WI	Fish Passage Culverts	Replace or retrofit a minimum of two perched culverts to allow for fish passage and other aquatic organism passage.	Under construction
9.21	MN/WI	Wild Rice Plan and Associated Restoration Sites	Develop a plan that identifies the high priority restoration sties and provides a process for restoring those sites. Restoration of 275 acres of wild rice.	Under construction

7. Climate Adaptation and Resilience:

a. Describe the climate trends in the general location of the project (see guidance: *Climate Adaptation and Resilience*) and how climate change is anticipated to affect that location during the life of the project.

General projections in Northeastern Minnesota predict that the climate will be warmer and wetter at the end of the century as compared with the historical period of 1981-2010[2]. According to the DNR Climate Trends website, Minnesota has warmed by 3.0 degrees

[2] Minnesota Climate Projections | Climate (umn.edu)

Fahrenheit between 1895 and 2020, and annual precipitation has increased by an average of 3.4 inches across the state[3]. In general, projections for Minnesota predict that the days per year with more than 1-inch of precipitation will increase, but summer precipitation will be lower (i.e., precipitation events will be larger, but more infrequent) by the end of the century, as compared with the historical period of 1981-2010[4]. Climate change impacts at the location of the project, will likely include warmer temperatures and more periods of drought with periodic flooding.

The proposed Project actions including providing improved hydrologic connection should improve the resilience of Mud Lake to changing precipitation events. Vegetation should also be able to better react to changes in water level due to increased variability and gradual coastline gradients. Additionally, fish and wildlife would have more habitat niches available for varying life stages.

b. For each Resource Category in the table below: Describe how the project's proposed activities and how the project's design will interact with those climate trends. Describe proposed adaptations to address the project effects identified.

[3] Climate trends | Minnesota DNR (state.mn.us)
[4] Minnesota Climate Projections (CMIP5) | University of Minnesota Climate Adaptation Partnership (umn.edu)

Resource Category	Climate Considerations	Project Information	Adaptations
Project Design	The proposed Project should consider increased frequency and intensity of storm events and increased precipitation.	Climate change risks and vulnerabilities identified include increased frequency and intensity of storm events, and flooding.	The proposed aims to improve hydrologic connection that would enhance the resilience of Mud Lake to changing precipitation events.
Land Use	The proposed project design should consider existing land use, potential land use changes, and the potential for impacts on climate. Climate trends for the general location predict a wetter climate with more frequent and higher intensity storm events.	Climate change risks and vulnerabilities identified include increased frequency and intensity of storm events, and increased precipitation.	The proposed Project would not affect floods levels or increase flooding risk to critical facilities. One of the goals of the proposed Project is to improve resilience of West Mud Lake to changing precipitation and event intensity by improving the hydrologic connection to the St. Louis River.
Water Resources	Addressed in item 12	Addressed in item 12	Addressed in item 12
Contamination/ Hazardous Materials/Wastes	The proposed Project should consider the risks for contamination, use of hazardous materials, and waste generation during the construction and phase of the project. Climate change predictions are not anticipated to influence the potential environmental effects of generation/use/storage of hazardous waste and materials for this project.	Construction equipment would utilize potentially hazardous materials such as gasoline or diesel fuels, motor oils, hydraulic fluids, and other lubricants. Additionally, the proposed Project would dredge, temporarily store, and transport contaminated sediments.	During construction, contractors would protect soil and water resources from contamination and hazardous materials. Vehicles would be equipped with spill kits for rapid response. All hazardous materials would be stored in containment apparatuses, while not in use. Additionally, the proposed Project would take appropriate measures to isolate dredged contaminated sediments from the St. Louis River during excavation; however, this storage would be temporary, so climate impacts are not expected to influence the contaminated sediments.
Fish, wildlife, plant communities, and sensitive ecological resources (rare features)	Addressed in item 14.	Addressed in item 14.	Addressed in item 14.

8. **Cover types:** Estimate the acreage of the site with each of the following cover types before and after development:

Cover Types	Before (acres)	After (acres)
Wetlands and shallow lakes (<2 meters deep)[1]	267.0	262.3
Deep lakes (>2 meters deep)	8.6	13.4
Wooded/forest[2]	2.2	2.2
Rivers/streams	0.0	0.0
Brush/Grassland[2]	0.9	0.9
Cropland	0.0	0.0
Livestock rangeland/pastureland	0.0	0.0
Lawn/landscaping	0.0	0.0
Green infrastructure TOTAL (from table below*)	0.0	0.0
Impervious surface	0.0	0.0
Stormwater Pond (wet sedimentation basin)	0.0	0.0
Other (describe) Railroad causeway	1.3	1.2
TOTAL	280.0	280.0

[1] This cover type estimate uses the deep-water definition of >6.6 feet (2m) in depth. Areas shallower than 6.2 feet are shallow open water wetlands included in the wetlands cover type, although they may be below the OHWL.

[2] The contractor would clear vegetation and some trees for staging/access; however, this would not be permanent, and these cover types would be allowed to regenerate.

Green Infrastructure*	Before (acreage)	After (acreage)
Constructed infiltration systems (infiltration basins/infiltration trenches/rainwater gardens/bioretention areas without underdrains/ swales with impermeable check dams)	0	0
Constructed tree trenches and tree boxes	0	0
Constructed wetlands	0	0
Constructed green roofs	0	0
Constructed permeable pavements	0	0
Other (describe)	0	0
TOTAL*	0	0

Trees	Percent	Number
Percent tree canopy removed or number of mature trees removed during development	0	25-50[1]
Number of new trees planted	0	0[1]

[1] The contractor would clear an estimated 25-50 mature trees for staging/access if the northern access option is used; however, this use would not be permanent and new trees would naturally reestablish.

9. Permits and approvals required: List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Unit of Government	Type of Application	Status
DNR	Public Waters Work Permit	To be submitted
DNR	Water Appropriations Permit - Temporary	To be submitted
DNR	Lake Superior Coastal Zone Federal Consistency Letter	To be submitted
DNR	Aquatic Plant Management Permit	To be submitted
DNR	Prohibited Invasive Species Permit	To be submitted
DNR	Natural Heritage Information System Review	Submitted
MPCA	Management of Dredged Material Permit	To be submitted
MPCA	NPDES/SDS Construction Stormwater General Permit	To be submitted
MPCA	CWA Section 401 Certification	To be submitted, if required; or included with NWP 27 approval
MPCA	Solid Waste	To be submitted, if required
MPCA	Compost Facility	To be submitted, if required
U.S. Army Corps of Engineers (USACE)	CWA Section 10/404 Permit – anticipated Nationwide Permit 27	To be submitted
USACE	Section 106 Consultation – National Historic Preservation Act	In Progress
USACE	Section 10 Permit – Rivers and Harbors Act	To be submitted
City of Duluth (LGU)	Wetland Conservation Act	To be submitted
WLSSD	Wastewater Discharge Permit	To be submitted, if required
MN SHPO	Section 106 Consultation – National Historic Preservation Act	To be submitted
City of Duluth	Filling/Grading/Excavation Permit	To be submitted
City of Duluth	MS4 Compliance Statement	To be submitted, if required
City of Duluth	Temporary Access agreement	To be submitted
City of Duluth	Special Use Permit for Construction	To be submitted, if required
City of Duluth	Erosion and Sediment Control Permit	To be submitted
City of Duluth	Shoreland Permit	To be submitted

Unit of Government	Type of Application	Status
City of Duluth, DNR, Federal Emergency Management Agency (FEMA)	No Rise Certification and/or LOMR	To be submitted
U.S. Fish and Wildlife Service (USFWS)	Federal Threatened/Endangered Species Review	Complete
USFWS	Migratory Bird Treaty Act	To be submitted, if required
US Steel	Temporary Access Agreement	To be submitted
CN Railroad	Temporary Access Agreement	To be submitted
MN Power	Temporary Access Agreement	To Be Submitted

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 10-20, or the RGU can address all cumulative potential effects in response to EAW Item No.22. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 21.

10. Land use:

a. Describe:
   i. Existing land use of the site as well as areas adjacent to and near the site, including parks and open space, cemeteries, trails, prime or unique farmlands.

The proposed Project is located in the SLRE, adjacent to the Gary New Duluth neighborhood of Duluth, MN (see Attachment 1: Figures 1, 2, and 4). The site is a sheltered bay of mostly open water surrounded by emergent wetlands. A CN rail line borders the site to the south and west. The U.S. Steel Corporation owns much of the property adjacent to the site and is a mix of barren, vegetated, and developed lands. There is residential and industrial land use to the west of Mud Lake. The St. Louis River channel and emergent wetlands border the site to the south and east. The community of Oliver, WI is also east of the site across the St. Louis River. A railroad causeway, eligible to be on the National Registry of Historic Places, bisects the site from northeast to southwest and is utilized by the non-profit Lake Superior & Mississippi Railroad (LSMR) for scenic train rides during summer and fall.

The main uses of the site are boating, hunting, fishing, bird watching, and other low density outdoor recreation activities. The St. Louis River Estuary Water Trail has multiple routes that pass through and adjacent to the site. The City of Duluth manages undeveloped parcels adjacent to the site as part of its Natural Areas Program. There are no prime or unique farmlands.

   ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

St. Louis River Area of Concern Remedial Action Plan (RAP)

The SLRAOC RAP is a comprehensive plan for delisting the SLRAOC through a series of action steps that address the BUIs designated for the estuary (Fond du Lac, DNR, MPCA, and WDNR 2024). The RAP details

the actions necessary to remove each of the BUIs identified for the SLRAOC.

The RAP identifies Mud Lake as a restoration site associated with actions for delisting of BUI 9: Loss of Fish and Wildlife Habitat. The proposed Project would improve the hydrologic connection and restore wetland habitat. The restoration project at Mud Lake is Action 9.09 in the 2023 RAP document.

City of Duluth Comprehensive Land Use Plan

The area around Mud Lake is identified as future open space and general mixed use. General mixed use is the broadest mix of uses, including light industrial, office, commercial, and residential use, with performance standards to ensure compatibility. It includes areas that are in transition from past industrial uses and large redevelopments that require master plans and phased development. General or heavy industrial can be included when a large site is master planned to allow appropriate separation of uses. Open spaces have high natural resource or scenic value, with substantial restrictions and development limitations. Primarily public lands, but limited private use, is anticipated around Mud Lake, subject to use and design controls. Examples include, city parks and recreation areas, primary viewsheds, shorelands of the lake and streams, wetlands and floodplains, and high-value habitat. These land uses are compatible with the habitat goals and objectives for the site.

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The proposed Project is compatible with the following local zoning and overlay districts:

Floodplain & Shoreland Management

The entirety of the Mud Lake Project Area is within a designated Federal Emergency Management Agency (FEMA) 100-year floodplain. The estimated base flood elevation in Mud Lake is currently controlled by the St. Louis River and Lake Superior water levels. Post-construction, the estimated base flood elevation would continue to be controlled by the St. Louis River and Lake Superior water levels. The additional capacity provided by the proposed causeway bridge would allow water levels in West Mud Lake to equalize more rapidly but would not change the estimated base flood elevation (Zone AE 604 feet). The proposed Project would not increase the frequency, magnitude, or extent of flooding.

The City of Duluth shoreland management zones specify development setback standards that apply to shorelands within 1,000 feet of Lake Superior or within 300 feet of rivers, creeks, streams, and tributaries. The three zone types are general development waters, natural environmental waters, and coldwater rivers with general development waters being the least restrictive and coldwater rivers being the most restrictive. For example, structures in general development waters, natural environmental waters, and coldwater rivers must be set back 50 feet, 75 feet, and 150 feet, respectively. The majority of the site is zoned as natural environment and the areas where two small streams enter the fringe wetland in the southwest corner of Mud Lake are zoned as general development.

City of Duluth Zoning

The proposed Project area is currently zoned as I-G – Industrial General. The I-G district is intended to provide for general- to heavy- impact industrial, processing, assembly, fabrication, and manufacturing uses. They may have off-site impacts and are generally isolated or buffered from other uses. Office uses are allowed provided they are clearly incidental to and supportive of on-site industrial uses. The district is intended primarily for locations close to major transportation corridors and active commercial centers.

Lake Superior Coastal Zone

The proposed Project is within the Lake Superior Coastal Zone under the jurisdiction of the Minnesota

Lake Superior Coastal Program (MLSCP) as administered by the DNR. The proposed Project is a federal action that has reasonably foreseeable effects on coastal uses or resources. It will be subject to the Federal Consistency Review. The DNR and federal agencies must follow the requirements of 15 Code of Federal Regulations (CFR) 930, Subpart C, which require a review of federal activities or federally funded projects to determine consistency, to the maximum extent practicable, with the enforceable policies of MLSCP.

The evaluation of federal consistency by DNR is a brief evaluation of the relationship of the proposed activity and its reasonably foreseeable coastal effects considered enforceable under the review. The review includes identifying whether federally approved state coastal policies are met, such as approved county shoreland ordinances and approved floodplain ordinances. The proposed Project is intended to be compatible with the terms of the review.

Other
Neither stream is designated as a wild and scenic river or critical area.

iv. If any critical facilities (i.e. facilities necessary for public health and safety, those storing hazardous materials, or those with housing occupants who may be insufficiently mobile) are proposed in floodplain areas and other areas identified as at risk for localized flooding, describe the risk potential considering changing precipitation and event intensity.

No critical facilities are proposed within the floodplain.

b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The proposed Project is compatible with all nearby land uses, local zoning ordinances, and associated plans. The Project would support the desired future us as open space in the City of Duluth Comprehensive Land Use Plan.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 10b above and any risk potential.

No incompatibility has been identified.

11. Geology, soils and topography/land forms:

a. Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

The Fond du Lac Formation consisting of shale, sandstone, and arkose of fluvial origin form the bedrock geology of the site. Surficial geology consists of floodplain alluvium, sandy or clayey lacustrine deposits, and disturbed sediment. The Natural Resource Conservation Service (NRCS) Web Soil Survey indicates that the depth to bedrock is more than 6.5 feet and soil borings on site indicate that it is more than 100 feet in some areas. There are no known susceptible geologic features present on site and the proposed Project would not impact site geology.

b. Soils and topography – Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 12.b.ii.

The Custom Soil Resource Report (available upon request) provided by the NRCS identifies the soils in the proposed Project area as the following:

- 1020A – Bowstring and Fluvaquents; 35.7% site coverage
  - 0-2% slopes, frequently flooded
  - loamy
- E18A – Urban land-Cuttre-Rock outcrop; 6.3% site coverage
  - 0-3% slopes
- E24F – Miskoaki-Cuttre complex; 6.3% site coverage
  - 5-45% slopes

Both 1020A and E24F have severe rutting susceptibility, and the erosion hazard (off-road, off-trail) is very severe for E24F and slight for 1020A. The compaction susceptibility is low for 1020A and medium for E24F. Organic matter content is high for 1020A and low for E24F. The soil texture is muck for 1020A and silt loam for E24F. The parent material for 1020A is alluvium, E18A has parent material of fill material from surrounding uplands, gravel pits, and blasted bedrock, and E24F is from clayey till.

Soil grading would occur over 2.2 acres to establish staging areas and road access down to Mud Lake if the northern access option is used. No grading is expected if the southern access route is utilized. The contractor would follow all permit sediment and erosion control BMP's and specifications to minimize soil erosion rutting. Construction vehicle traffic would be confined to a minimal number of access roads and routes to prevent widespread rutting and soil compaction. The contractor would not work during large rain events and would minimize impacts to soils susceptible to rutting. Access paths and areas that may have experienced soil compaction can be tilled at the end of construction to loosen soils.

Mud Lake sediments have been sampled several times from 2015 through 2024 to characterize the chemical and physical characteristics. Material to be dredged during the proposed Project consists primarily of organic material (peat) with amounts of clay, silt, and sand. Very soft to stiff clay may be encountered within the dredge prism. Very heavy/thick vegetative matter (e.g., thick mats of cattail material) would likely be encountered in the top layer in the emergent wetland areas surrounding Mud Lake.

The proposed Project would dredge a total of 100,500 cubic yards of material, with 4,100 cubic yards containing contaminants and the remaining 96,400 cubic yards of uncontaminated material being suitable for beneficial reuse in upland or aquatic environments. An estimated 15,000 cubic yards of the uncontaminated material from RU3 would be reused on site to create additional area of coastal marsh habitat and most of the 25,500 cubic yards of dredged material from RU4 would be side cast to form habitat mounds. As described in Item 12.b.ii, the contractor would use typical erosion and sediment control BMPs to prevent mobilization of all material into nearby water resources.

- NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 12 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 11.

12. Water resources:

a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.

i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, shoreland classification and floodway/floodplain, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include the presence of aquatic invasive species and the water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

Mud Lake is a sheltered bay of the upper St. Louis River Estuary (69129104)(Kittle # S-002), a DNR public watercourse. Three non-public water streams flow into Mud Lake from the west, Gary Street Creek, Bowser Street Creek, and Heard Street Creek. The St. Louis River channel flows from south to north along the eastern edge of Mud Lake. It is a lake of outstanding biological significance, a Minnesota Biological Survey site of high biodiversity significance, and is identified as a wild rice lake by the DNR.

The Upper Estuary (St. Louis River) (AUID: 69-1291-04) is classified as a Class 2B waterbody (Aquatic Life & Recreation – Warm Water Habitat (lakes & streams)), 3 (Industrial Consumption), 4A (Agriculture & Wildlife) (irrigation), 4B (Agriculture and Wildlife) (livestock and wildlife), 5 (Aesthetic Enjoyment and Navigation), and 6 (Other Uses).

The site is mostly classified as natural environment shoreland management zone with two small areas classified as general development shoreland management zone as described in Section 10.a.iii. The entirety of the proposed Mud Lake Project Area is within a Zone AE floodplain, with an estimated base flood elevation of 604 feet. The site is not designated as a trout, wildlife, or migratory waterfowl feeding/resting lake.

Individual wild rice plants can be found sporadically at Mud Lake, but it does not contain wild rice beds. It holds that designation because it is within the SLRE, not due specifically to Mud Lake. There are other SLRE areas that produce wild rice and the entire SLRE historically produced wild rice. The proposed Project would not have any adverse impacts to wild rice; it has the potential to open new areas where wild rice could establish.

There are many documented invasive species present in the St. Louis River including alewife, common carp, Eurasian ruffe, freshwater drum, round goby, three-spine stickleback, white perch, spiny water flea, snails, quagga and zebra mussel. Current water quality impairments within one mile of the proposed Project are shown in the table below.

Table 3. MPCA 2022 Impaired Waters List [Section 303(d) of the Clean Water Act]

Reach Name	Reach Description	Year Added to List	Stream/River Segment ID	Affected Designated Use	Pollutant or Stressor
Upper Estuary	Lake; Beginning of estuary to Spirit Lake	2002	69-1291-04	Aquatic Consumption	DDT (Dichlorodiphenyltrichloroethane)
Upper Estuary	Lake; Beginning of estuary to Spirit Lake	2002	69-1291-04	Aquatic Consumption	Dieldrin
Upper Estuary	Lake; Beginning of estuary to Spirit Lake	1998	69-1291-04	Aquatic Consumption	Mercury in fish tissue
Upper Estuary	Lake; Beginning of estuary to Spirit Lake	1998	69-1291-04	Aquatic Consumption	Mercury in water column
Upper Estuary	Lake; Beginning of estuary to Spirit Lake	1998	69-1291-04	Aquatic Consumption	Polychlorinated biphenyls (PCBs) in fish tissue
Upper Estuary	Lake; Beginning of estuary to Spirit Lake	2002	69-1291-04	Aquatic Consumption	PCBs in fish tissue
Upper Estuary	Lake; Beginning of estuary to Spirit Lake	2020	69-1291-04	Wild Rice Production	Sulfate
Spirit Lake	Lake; Upper Estuary to St. Louis Bay	2004	69-1291-03	Aquatic Consumption	Mercury in fish tissue
Spirit Lake	Lake; Upper Estuary to St. Louis Bay	2004	69-1291-03	Aquatic Consumption	PCBs in fish tissue
Sargent Creek	Headwaters to Upper Estuary (St. Louis River)	2012	04010201-848	Aquatic Recreation	Escherichia coli (E. coli)

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

The proposed Project is located in open water and areas of saturated soils such that depth to groundwater is not applicable. Upland areas adjacent to the site have depth to groundwater ranging from 30 centimeters to more than 6.5 feet. There are no know aquifers, springs, or seeps on site.

The proposed Project site is not located in a wellhead protection area. There are numerous wells near the site.

Monitor wells: 784639, 564555, 784640, 784643, 784642, 783137, 783138, 784641, 769543, 769545, 769542, 769547, 783126, 769550, 783135, 783130, 783134, 783140, 783139.

Sealed wells: 783128, 783131, 332077, 332078, 332079, 332080, 783132, 783136.

Other wells: 1000021853.

Unverified wells: 783129, 751574, 522318, 522316, 522323, 522324, 522322, 769548, 783133, 783127, 769546, 769544, 751572, 751573.

b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

Not applicable.

2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system. If septic systems are part of the project, describe the availability of septage disposal options within the region to handle the ongoing amounts generated as a result of the project. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion.

Not applicable.

3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects.

The contractor would process 4,100 cubic yards of contaminated dredged sediments, 56,000 cubic yards of non-contaminated dredged sediments, and cattail material in separate areas within the dewatering area west of Mud Lake within the proposed Project area. The dewatering pad design includes a drainage layer overlying a geomembrane liner with perimeter containment berms to collect effluent draining from the sediment. The contractor would position the Geotubes® on the dewatering pad empty and fill the Geotubes® by inserting a discharge pipe into ports at the top of the Geotubes®. The contractor would also place the dredge-screening tank, polymer injection unit, and water treatment plant within or near the dewatering pad area.

The contractor would hydraulically pump the majority of the dredged sediments as a slurry to the dewatering pad area, screen out debris and vegetation, and add polymer(s) to the Geotubes® to aid in flocculation of the fine-grained sediment if needed. Some sediments and cattail material will not be conducive to hydraulic pumping so they would be mechanically dredged and transferred to dump trucks for transport to the dewatering area where it would be processed for Geotube® placement or piled in its own contained

area. Effluent would drain from the Geotubes® through the fabric, dewatering the sediment, and reducing the volume and weight of the contained material. Following dewatering, the solids remain in the tube and continue to reduce in volume due to desiccation from water vapor escaping through the fabric.

The contractor would treat the effluent collected from the Geotubes® containing contaminated dredged sediments in a temporary water treatment plant prior to discharging the water into the St. Louis River via an outflow pipe. The contractor would treat the discharge water to meet WQ standards and WQ criteria set by the MPCA for all COC, as well as other treatment limits set by state or federal agencies and discharge the effluent into the St. Louis River. The contractor is responsible for all aspects of the water treatment plant, including verifying the design parameters and the installation, maintenance, and removal of the water collection, storage, treatment, and disposal infrastructure. Water draining from the containment areas containing cattail material and uncontaminated sediments would not need to be treated before being returned to the St. Louis. However, the effluent would still filter through the base layers of the facility and the outflow water quality would be monitored.

There are no anticipated effects to surface or groundwater from wastewater discharges when considering future climate trends. All discharge would be returned to the waterbody that it came from and would be temporary in nature so it would not exacerbate concurrent or future flood events. The return of water to west Mud Lake would also take time as it drains from the Geotubes® and flows through the dewatering facility and back to the lake. This would also moderate any impacts.

ii. Stormwater - Describe changes in surface hydrology resulting from change of land cover. Describe the routes and receiving water bodies for runoff from the project site (major downstream water bodies as well as the immediate receiving waters). Discuss environmental effects from stormwater discharges on receiving waters post construction including how the project will affect runoff volume, discharge rate and change in pollutants. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion. For projects requiring NPDES/SDS Construction Stormwater permit coverage, state the total number of acres that will be disturbed by the project and describe the stormwater pollution prevention plan (SWPPP), including specific best management practices to address soil erosion and sedimentation during and after project construction. Discuss permanent stormwater management plans, including methods of achieving volume reduction to restore or maintain the natural hydrology of the site using green infrastructure practices or other stormwater management practices. Identify any receiving waters that have construction-related water impairments or are classified as special as defined in the Construction Stormwater permit. Describe additional requirements for special and/or impaired waters.

The quality and quantity of stormwater runoff is not expected to change following construction of the proposed Project. Currently, the surrounding landscape has extensive natural cover that slows and filters overland flow. Other than potential access routes, the proposed Project footprint is mostly below the OHWL and would not impact the surrounding landscape. The proposed Project is not anticipated to change the course, volume, or rate of stormwater runoff; however, the improved connection between Mud Lake and the St. Louis River may increase the capacity for Mud Lake to buffer against flooding due to spring runoff and large precipitation events.

During construction there is the potential for stormwater runoff effects near construction access points. The Proposer would obtain a NPDES/SDS Construction Stormwater General permit. The construction contractor would prepare a Stormwater Pollution Prevention Plan (SWPPP) to address the Best Management Practices (BMPs) necessary to manage, control, and/or treat stormwater runoff before it enters the St. Louis River. BMPs placed during construction would need to include redundant down gradient sediment controls if the proposed Project must encroach the existing 50 feet of the natural buffer to any of the surface waters or wetlands at the site. These BMPs would need to be located at the OHWL and would be in addition to any sediment control BMPs located below the OHWL of any part of the project. The SWPPP must identify and address all disturbed areas above the existing OHWL and describe the proposed control structures needed to manage stormwater runoff from the site, including engineering designs for these structures in the construction plans. No construction-related water impairments are anticipated.

The Proposer would coordinate with MPCA construction stormwater staff to identify appropriate sediment controls for the project, which would be incorporated into the plan set and specifications. Section 12b.iv.b further describes the BMPs that would be used to mitigate environmental effects to surface water from excavation activities. The Proposer would ensure that erosion is controlled, sedimentation is prevented, and all permit provisions are adhered to. The Proposer would also conduct construction activities in a manner that would minimize soil erosion. Temporary erosion control measures would be installed before commencing construction, inspected, and maintained during construction, and removed when no longer necessary.

iii. Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Discuss how the proposed water use is resilient in the event of changes in total precipitation, large precipitation events, drought, increased temperatures, variable surface water flows and elevations, and longer growing seasons. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation. Describe contingency plans should the appropriation volume increase beyond infrastructure capacity or water supply for the project diminish in quantity or quality, such as reuse of water, connections with another water source, or emergency connections.

The proposed Project would require a DNR non-consumptive water appropriation permit for the duration of the proposed Project. The contractor would use an estimated one million gallons of water from the St. Louis River to hydraulically dredge sediment and to transport dredged sediment to the dewatering area and coastal marsh creation component. This is expected to take 50 days, and all water would be returned to the St. Louis River. The contractor would treat water used in the transportation of contaminated sediment prior to discharge into the St. Louis River. Techniques and BMPs for appropriating water would be coordinated with the DNR water appropriation hydrologist. The proposed Project would not impact any existing infrastructure or municipal water systems.

iv. Surface Waters

a) Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed and identify those probable locations.

The U.S. Army Corps of Engineers (USACE) delineated wetland boundaries in the proposed Project area and drafted a report in 2022. This report is available upon request.

Table 4 compares the approximate acreages of each wetland type before construction and after construction from the USACE report. Areas within the study limits that would not be altered by the project are also included.

Table 4. Summary of pre- and post-construction wetland area.

Habitat Type	Before (Acres)	After (Acres)
Fresh (wet) meadow	9.1	9.1
Shallow Open Water	80.9	83.9
Lake	175	172
Total	265	265

The new channel (RU2) and hemi-marsh (RU4) components would deepen portions of the open water wetlands through excavation of vegetation and sediments; however, the depths post-project would remain less than 6.6 feet deep, which remains within the shallow open water classification. The coastal marsh (RU5) component would convert 3 acres of lake to shallow open water wetland by creating depths ranging from 1-3 feet with the placement of dredged material from RU3. The deep-water (RU3) component would deepen 5 acres of lake but would not change the classification. No wetlands or aquatic resources would be converted to upland. The Proposer considers the proposed Project to be in alignment with the RAP and, therefore, is not proposing any mitigative offsets. The proposed Project's alterations to wetland features would improve Mud Lake's plant communities, fish, and wildlife species to be more resilient to impacts of climate change.

Vegetation communities would change in RU's 2, 4, and 5. In RU's 2 and 4, emergent hybrid/narrowleaf cattails would be replaced with a more diverse mix of native emergent and submerged species. RU5 currently has areas with submerged vegetation but would support mainly emergent vegetation once complete. The loss of vegetative cover would be temporary following construction. A planting plan would be created to specify areas where seeding, planting, installation of plugs, or natural recruitment would take place. A mix of methods and native species would be utilized depending on RU characteristics.

Climate trends are not anticipated to influence the long-term success of the proposed Project. The proposed Project's actions, including providing improved hydrologic connection, would improve the resilience of Mud Lake to changing precipitation events. Additionally, the proposed Project's changes to vegetation would be able to better adjust to changes in water level due to increased variability and gradual coastline gradients.

b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

The proposed Project would impact open water areas of Mud Lake, part of the St. Louis River – Upper Estuary waterbody. RU3 would convert 5 acres of mid-depth open water (5-6 feet) to deep water depths (10+ feet) by excavating 40,000 cubic yards of sediment. RU5 would convert 3 acres of shallow to mid-depth open water to shallow open water wetlands by placing 15,000 cubic yards of material dredged from RU3. The excavation of the railroad causeway in RU1 would also create an additional 0.1 acres of open water. There would be minimal loss of vegetation by deepening open water in RU3 because the area is already too deep to support vegetation. The RU5 area currently holds sparse vegetation but would support widespread coverage of emergent vegetation once complete. The Proposer considers the proposed Project to be in alignment with the RAP and, therefore, is not proposing any mitigative offsets.

Excavation

Open water habitat of 10+ feet in depth would be restored through the excavation of up to 40,000 cubic yards of sediment. Direct and indirect environmental effects on surface waters related to the project are discussed below.

Impacts from Excavation of Material

The contractor would excavate fine sediments and organic matter from Mud Lake. The short-term water quality impact may include turbidity in the water column due to sediment disturbance at the location where the material is excavated or placed. The contractor would minimize these impacts by employing in-water BMPs, such as use of a weighted turbidity curtain (detail to be included in SWPPP) at the dredge and placement locations. Potential indirect effects include discharge to the main channel, which would be mitigated by providing appropriate sediment controls as described above.

In-water construction (below the OHWL) includes all excavation of Mud Lake. Inherent in the operation of diesel and gasoline-powered machinery are risks of fuel and oil spills associated to equipment failure, such as hydraulic line breakage or leaks from faulty connections or refueling operations. Both the DNR and other

permits will require contractors to have a spill response and prevention plan.

The proposed Project does not anticipate impacting the number or type of watercraft utilizing Mud Lake. West Mud Lake is currently inaccessible to boat traffic and would remain so after completion (options to create access were considered but found to be unfeasible). East Mud Lake would remain accessible to small and medium boats.

13. Contamination/Hazardous Materials/Wastes:

a. Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

West Mud Lake was identified as potentially requiring remedial action to address contamination for the SLRAOC. Remedial investigations by the MPCA in west Mud Lake from 2010 to 2016 identified sediments contaminated with nickel, zinc, and polychlorinated dibenzo-p-dioxins/dibenzofurans (dioxins/furans), primarily in the top two feet of sediment. Dioxins/furans are the primary contaminants of concern due to their ability to bioaccumulate in benthic tissue, which can migrate up the food chain to higher trophic levels. No impacted soil or sediment was found above relevant risk criteria in upland areas or within interior areas of the cattail wetlands. A Focused Feasibility Study was prepared in 2017 along with an addendum in 2019 that included bioaccumulation testing and evaluated remedial alternatives. The no action alternative was selected because the site has limited human exposure and total organic carbon levels prevent unacceptable risk to human health or the environment. Additional sampling in 2022 and 2024 conducted by USACE found additional isolated pockets of heavy metals and dioxins/furans in East Mud Lake. The deep-water habitat was positioned to avoid dredging in or exposing areas with contaminated sediments.

The contractor would prepare a Spill Contingency Plan and the DNR would review the Plan prior to construction. The Plan would summarize spill prevention measures, spill containment/control procedures, reporting requirements, and clean up requirements.

Dredging would mostly occur in areas of noncontaminated sediments; however, the southern end of the RU2 (New Channel) would require dredging of contaminated sediments. Approximately 4,120 cubic yards of contaminated sediments would be dredged, dewatered, and properly disposed of at an approved local landfill. The Proposer is working closely with the MPCA to ensure the proposed Project would not expose additional contaminants or allow existing contaminants to migrate to other parts of the estuary post construction. Areas with contaminants are well defined and the Proposer would work closely with the contractor to ensure they adhere to the dredge footprint.

The west boundary of Mud Lake is formed by a large bluff created from slag and other waste material disposed there during U.S. Steel operations. At the base of the bluff is a pond known to have pH levels up to 11.5, though the pH attenuates quickly in the surrounding wetland. The proposed Project is not impacting the area near this pond.

b. Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

The proposed Project would excavate approximately 4,210 cubic yards of sediment contaminated with dioxins/furans and some heavy metals. The contractor would take appropriate measures to isolate this area from the St. Louis River during excavation. The material would either be hydraulically pumped or mechanically offloaded and trucked to the dewatering site where it would be dewatered using Geotubes®. Once the material has been dewatered it would be trucked to an approved local landfill for disposal. All water coming from the dewatering process would be treated before being returned to the St. Louis River.

The proposed Project is not expected to generate significant amounts of other solid waste. The contractor would be responsible for hauling any construction-generated wastes off site to appropriate solid waste management facilities. Should unanticipated materials be encountered during construction activity, they would be evaluated, and the contractor would be responsible for proper disposal, including hauling off-site to an appropriate solid waste management facility if required, and in accordance with all applicable federal state, and local laws, rules, and regulations.

c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any new above or below ground tanks to store petroleum or other materials. Indicate the number, location, size and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

The contractor's equipment requires fuel (diesel and/or gasoline) and oils (lubricating and hydraulic). The contractor would comply with the U.S. Coast Guard, and Wisconsin and Minnesota Departments of Transportation regulations as applicable to marine work, construction activities, and truck transport for handling of fuels and oils.

No hazardous materials would be permanently stored on-site. Hazardous materials may be stored on- site during specific construction activities. If on-site, hazardous materials would be stored in a designated area at least 100 feet from water or drainage ways. Hazardous material storage on-site would require secondary containment, signage, and preventive maintenance inspections. Spill kits would be stored near any hazardous materials. Vehicle maintenance would only be allowed in designated areas. Hazardous materials may be stored on barges during in-water construction work. Secondary containment, routine preventive maintenance inspections, and spill kits would be required.

The contractor would take special measures to prevent chemicals, fuels, oils, greases, and other pollutants from entering the waterway. The contractor would have a Contaminant Prevention Plan and a Spill Control Plan in the event of an unforeseen spill of a substance regulated by the Emergency Response and Community Right-to-Know Act or regulated under state or local laws or regulations. The contractor would report all spills immediately to the DNR contracting officer and any reportable quantities to the legally required federal, state, and local reporting channels (including the National Response Center 1-800-424-8802 and the Minnesota Duty Officer). The

contractor is required to have spill kits on site to contain and/or neutralize accidental minor discharges. These safeguards minimize the chance of a significant impact.

The BMP's listed above reduce the chances of an accidental spill and would help to confine adverse impacts. Potential environmental impacts of an accidental spill or release include contamination of soils and water resources and degradation of habitat. Direct contact with hazardous materials or contaminated soil and water can disrupt the lifecycle of fish and wildlife and lead to sickness and death. Plant communities can also be damaged or killed by contact with contaminants. If spills are not properly isolated or remediated, these impacts can persist in the environment.

d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

The contaminated sediments dredged for the proposed Project do not meet the definition of hazardous waste, and no other actions by proposed Project would generate any hazardous wastes.

14. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):

a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

Fish

The Estuary is an important component of the western Lake Superior fishery. The variety of water depths, substrate composition, aquatic vegetation, and protected shallow areas provide important habitat for all life stages of fish. Fish are likely to spawn in one habitat and feed or shelter in other habitats, with overall use of an area changing depending on the species, life stage, and season. A diversity of habitat types within the Estuary allows it to support a large and diverse warm-water fish community of approximately 54 species, which includes important gamefish species such as lake sturgeon, walleye, muskellunge, smallmouth bass, channel catfish, northern pike, black crappie, and bluegill. The Estuary also supports seasonal use by cold-water fish species from Lake Superior including coaster brook trout, brown trout, rainbow trout, lake trout, tullibee (cisco), and burbot. Many species use the river and SLRE to spawn and return to Lake Superior.

More information about SLRE fish species can be found in the DNR's Fisheries Lake Management Plan for the SLRE (DNR 2019). The management plan also includes historical and future fisheries management goals and objectives. Proposed Project habitat improvements would support walleye and muskellunge goals.

In general, fisheries habitats of mid-depth, open water (depths of 6 to 8 feet) and deep, open water (depths of 8 to 15 feet) are more limited in the Estuary than shallow, open water because of historical habitat alterations. Shallow and mid-depth, open water habitat provides important nursery and foraging areas for lake sturgeon and game species such as walleye, muskellunge, and northern pike, while deep, open water habitat provides overwintering habitat for these species, as well as black crappie, bluegill, and bass (*Micropterus* spp.).

The Mud Lake fish community was sampled in late September 2023 and June 2024. A report has not been produced at the time of this writing, but at least 10 species were sampled with a large

proportion of young-of-the-year bluegill. The DNR summer gillnet data shows that typically five to ten species are captured.

Wildlife

The SLRE is recognized by the National Audubon Society as an Important Bird Area for waterfowl, raptors, shorebirds, gulls, and passerines, and is noted for being one of the best and most popular sites for bird watching in Minnesota. The area serves as a corridor for migrating songbirds, shorebirds, and raptors, and provides critical food and shelter for these migrants.

Birds seen foraging in the marshes of the SLRE includes Bald Eagle, Osprey, Merlin, Common Tern, Northern Harrier, and Belted Kingfisher. Resident birds include Double-crested Cormorant, Virginia Rail, Sora, Marsh Wren, Common Yellow-throat, Swamp Sparrow, Song Sparrow, Yellow Warbler, and a variety of waterfowl. Over the years, more than 230 bird species have been documented in the SLRE.

Mud Lake was included in an avian survey completed by University of Minnesota Duluth – Natural Resources Research Institute (NRRI) staff in 2018. A total of 4,498 individuals and 107 species were observed in Mud Lake from April–October 2018 (Liljenquist et. al 2019). The number of species was higher than any other surveyed area, with most being from the waterfowl, blackbird, or songbird guilds. There were also 32 species of conservation concern detected. The shallow wetland habitats at Mud Lake are used by a wide variety of species throughout the year, including many breeding marsh birds and migrating waterfowl.

The hemi-marsh surrounding Mud Lake may also be utilized by mammals including beaver, otter, and muskrat (*Ondatra zibethicus*). Muskrat, in particular, are an effective aquatic grazer and can be a significant control factor for cattail. In general, muskrat require higher water levels for overwintering; Sojda and Solberg (1993) recommended 4–5-foot depths are needed in most areas.

Vegetation

The proposed Project is located within the Split Rock Till Plain Land Type Association, a part of the North Shore Highlands subsection and Northern Superior Uplands Section of the Ecological Classification System of Minnesota. Historically, the forest type in the area was comprised of white and Norway pine, cedar, aspen, and birch. Today, upland areas adjacent to the project are dominated by deciduous forest tree species including ash, aspen, birch, maple, basswood, and oak.

The extensive marsh community surrounding Mud Lake is strongly dominated by non-native (narrowleaf and/or hybrid) cattails. These form a dense stand and thick thatch, to the exclusion of most other plant species. The NRRI technical report identifies this wetland community as “cattail – bur-reed marsh” (NRRI 2020). The report also identifies smaller areas of “water lily shallow marsh” and “mixed macorphyte hemi-marsh” in fringe areas with more depth. There is sparse submerged aquatic vegetation until water depths reach more than six feet where there is little vegetation due to a lack of sunlight penetration.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota Biological Survey Sites of Biodiversity Significance, andother sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (MCE_____) from which the data were obtained and attach the Natural Heritage Review letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The Natural Heritage Review program provided a review of rare species, significant natural features, and recommendations for avoidance of adverse effects (MCE 2022-00436, available upon request). The Natural Heritage Review identified the following rare features that may be adversely affected by the project:

- A Site of High Biodiversity Significance exists in the vicinity of the project area. Sites ranked as 'High' contain very good quality occurrences of the rarest species, high quality examples of rare native plant communities, and/or important functional landscapes.
- The Minnesota Biological Survey identifies the following native communities within or adjacent to the project area:
    - Estuary Marsh (Lake Superior), state-ranked as Critically Imperiled
    - Black Ash – Aspen – Balsam Poplar Swamp (Northeastern), Aspen – Birch – Red Maple Forest, and Sedge Meadow, state-ranked as Apparently Secure
    - Alder – (Maple – Loosestrife) Swamp and Willow – Dogwood Shrub Swamp, state-ranked as Secure
- The SLRE in the vicinity of the project has been identified as a Lake of Outstanding Biological Significance.
- Vascular Plants
    - Two leaf waterweed (*Elodea bifoliata*), a state-endangered species.
        - A vegetation survey completed in the early fall of 2022 found no two leaf waterweed specimens. The Natural Heritage Review has no further concerns.
    - Discoid beggarticks (*Bidens discoidea*), a state-listed species of special concern.
        - A vegetation survey completed in the early fall of 2022 found no discoid beggarticks specimens. The Natural Heritage Review has no further concerns.
- Invertebrate Animals: Rusty-patched bumble bee (*Bombus affinis*), a federally endangered species; creek heelsplitter (*Lasmigona compressa*), a state species of special concern; Eastern Elliptio (*Elliptio complanata*), a state species of special concern.
- Vertebrate Animals: Lake Sturgeon (*Acipenser fulvescens*), a state species of special concern; common terns (*Sterna hirundo*), a state-listed threatened bird; the northern long-eared bat (*Myotis septentrionalis*), a federally-listed threatened species and state-listed species of special concern, can be found throughout Minnesota; however, the NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

A U.S. Fish and Wildlife Service (USFWS) consultation using the online Information, Planning, and Conservations (IPaC) system (documents available upon request) identified four additional federally listed species, all listed as threatened: the Canada Lynx, Gray Wolf, Rufa Red Knot, and the Monarch Butterfly. The proposed Project does not overlap with critical habitat for any of these species and the IPaC system determined that the proposed Project would not affect the Monarch Butterfly and may affect but is not likely to adversely affect the Canada Lynx, Gray Wolf, and Rufa Red Knot. No additional coordination is required by USFWS.

c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project including how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

Fish and Wildlife

The proposed Project would have temporary negative impacts to fish and wildlife communities within the proposed Project area. Temporary impacts may include displacement due to increased activity and noise levels during construction. Most fish species would be temporarily displaced and may be harmed by suspended solids, but these impacts will be temporary. Individual fish may be directly impacted by dredging activity. Additionally, less mobile animals such as macroinvertebrates, mussels, and amphibians living within dredge footprints will be susceptible to project impacts. This could be from ambient impacts like temporary changes to water quality or from direct physical impacts of dredging activity. The DNR is investigating potential impacts to mussels in Mud Lake and how to avoid them. Birds and semiaquatic mammals may be temporarily displaced during construction but will be able to avoid the project area once construction starts. In the long term, fish and wildlife communities would benefit from improved connectivity and water quality, a more diverse plant community, increased amount and quality of over-wintering habitat for fish, as well as new habitat niches available for different life stages of fish and wildlife.

Plants

Most plant communities within the proposed Project boundary would not be affected. However, within the footprints of the new channel and hemi-marsh features, “cattail – bur-reed marsh” communities would be converted to “water lily shallow marsh” and “mixed macrophyte hemi-marsh” communities, which is a desired outcome of the proposed Project. Other areas impacted by equipment movements or dredging may see temporary loss of vegetation, but it would regenerate naturally.

Rare Features and Ecosystems

The proposed Project is expected to improve connectivity, provide new niche habitats, increase plant diversity, and reduce the coverage of the hybrid/narrowleaf cattail monoculture, thereby benefiting sites with biological significance and native plant communities. Estuary Marsh (Lake Superior) is a state-ranked critically imperiled native plant community that should expand its coverage in West Mud Lake as a result of the new bridge allowing more varied hydrology due to improved connection to Lake Superior’s seiche effects (a seiche is the fluctuation of water surface at each end of a waterbody due to weather or atmospheric conditions). The coastal marsh area in east Mud Lake would also support the Lake Superior Estuary Marsh plant community. No impacts are expected to upland plant communities.

Lake Sturgeon can be adversely impacted by actions that alter hydrology or decrease water quality, including sedimentation, dredging and filling, dewatering, impoundment, eutrophication, channelization, and pollution/contamination. The proposed Project may temporarily impact Lake Sturgeon in the vicinity of the proposed Project, however, improvements to water quality in West Mud Lake and new deep-water habitat would benefit Lake Sturgeon once the proposed Project activities are complete. Additional information about the Lake Sturgeon population, management, and goals can be found in the DNR’s Lake Sturgeon Management Plan (DNR 2019).

Common terns were documented in the vicinity of the proposed Project during the 2012 breeding season; however, a nesting site was not identified. This species nests on the ground on sparsely vegetated islands in large lakes. They have also been known to nest on open sandy or gravelly beaches. Suitable nesting habitat does not appear to be present within or near the proposed Project

area. There are not expected to be any impacts to common terns.

Northern long-eared bats typically roost during summer months underneath bark or in cavities of live trees and snags (standing, dead, or dying trees); in the winter they typically hibernate in caves or mines. The NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed Project. The proposed Project would clear approximately 25-50 trees greater than 3 inches in diameter at breast height in access areas which could impact northern long-eared bats.

Canada Lynx, Gray Wolf, Rufa Red Knot, and the Monarch butterfly are unlikely to be affected by the proposed Project.
The proposed Project is not anticipated to have any negative impacts when considering future climate trends. It would result in more diverse habitat that would allow fish, wildlife, and plant communities to adjust to changing conditions, thereby increasing their resilience to climate change impacts. Additionally, flood capacity may slightly improve by increasing the connectivity to west Mud Lake.

According to DNR sampling efforts in the SLRE, a variety of invasive species have entered the harbor over the last several decades, including Alewife, Common Carp, Eurasian Ruffe, Freshwater Drum, Round Goby, Three-spine Stickleback, White Perch, spiny water flea, New Zealand mud snail, and zebra and quagga mussel. DNR contracting documents include language that requires preventing or limiting the introduction, establishment, and spread of invasive species during construction activities. Among other things, the contractor is required to prevent invasive species from entering or spreading within a project site by cleaning equipment and clothing prior to arriving at the project site. If invasive species are determined to be within the proposed Project limits, the contractor would also be required to clean equipment prior to leaving the project limits. Section 14d provides more information on the efforts to prevent the introduction and spread of invasive species.

d. Identify measures that will be taken to avoid, minimize, or mitigate the adverse effects to fish, wildlife, plant communities, ecosystems, and sensitive ecological resources.

Measures to minimize disturbance to fish, wildlife, plant communities, ecosystems, and sensitive ecological resources include:

- Minimize vehicular disturbance where possible (allow only vehicle and equipment necessary for construction activities).
- Use of effective erosion prevention and sediment control measures, including the use of natural materials instead of plastic or nylon that can entrap wildlife.
- Revegetate disturbed soil with native species suitable to the local habitat as soon after construction as possible.
- Use of weed-free mulches and seed mixes.

The contractor would isolate the active work area through the installation of turbidity curtains or steel sheet pile and monitor turbidity levels upstream and downstream of the proposed Project. The in-water work would not occur before July 1 in order to avoid potential impacts to fish spawning, unless a waiver is obtained from DNR fisheries staff. A waiver, if granted, would set requirements on construction locations and methods that would minimize impacts to the fish community.

To protect northern long-eared bats, tree clearing would be minimized on site. Trees would be cleared only as needed for construction and construction access. To avoid adverse effects to the northern long-eared bat and spring/summer nesting birds, trees would be removed between November 15th and March 31st, outside the active season for the bat and nesting season for birds.

The DNR requires preventing or limiting the introduction, establishment and spread of invasive species during activities on public waters and DNR-administered lands. Impacts from accidental introduction or harboring of invasive species, related to the removal, transport, and placement of imported or dredge materials are expected to be minimal. The contractor shall prevent invasive species from entering or spreading within the proposed Project site by cleaning equipment and clothing prior to arriving. The contractor shall inspect all equipment and clothing at the staging area determined at the pre-construction meeting.

If the equipment or clothing arrives at the proposed Project site with soil, aggregate material, mulch, vegetation (including seeds) or animals, it shall be cleaned by contractor-furnished tools or equipment (brush/broom, compressed air, or pressure washer) at the staging area. The contractor shall dispose of material cleaned from equipment and clothing at a location determined by the DNR or their representative. If the material cannot be disposed of onsite, secure material prior to transport (sealed container, covered truck, or wrap with tarp) and legally dispose of offsite.

The contractor shall clean equipment and clothing as noted above, prior to entering and leaving the waterbody. Prior to leaving the waterbody, the contractor would drain water from all equipment, tanks, or water-retaining components of boats (motors, live well, and bilge). Immediately after leaving the waterbody, the contractor would drain water from transom wells onto dry land.

Additionally, the site vegetation will be surveyed through the AOC program in the years following the project. Longer term, the site will be monitored and occasionally surveyed as part of routine DNR and partner operations in the SLRE. DNR is establishing a more programmatic approach to monitoring and treating invasive species within the SLRE.

15. Historic properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

The USACE conducted a Phase I archaeological survey for a portion of the proposed Project area in 2017 and for the remaining area in 2024. The 2017 survey included a literature review, terrestrial survey where rights-of-entry were available, and an underwater survey. The railroad grade from the Lake Superior and Mississippi Railroad was the only historic property identified and it is eligible for the National Register of Historic Places. The underwater survey also located two additional features with unknown significance: a concrete structure and a sunken rowboat. It was recommended to avoid impacting these areas without additional investigations. The 2024 survey also included a literature review, terrestrial survey including shovel testing, and an underwater survey. No new archaeological resources were identified in the literature review or terrestrial survey. The underwater survey identified six potentially significant targets. At the time of this writing, the Project team is gathering more information about these targets. Given the current design, the proposed Project only has the potential to impact two of the six targets. USACE will continue evaluating the significance of these targets and potential impacts in close coordination with SHPO.

Approximately one mile of the LSMR causeway runs through the proposed Project area and would be impacted by the installation of a new 50-foot bridge. Impacts identified include a change in appearance of the historic causeway, increased costs to LSMR due to bridge inspections, and the potential shut down of LSMR operations, which collectively have been determined to have an adverse effect under Section 106 of the National Historic Preservation

Act. Proposed mitigation measures for this adverse effect include altering the bridge design to closely match the appearance of the existing Mud Lake bridge, raising the height of the bridge to reduce LSMR inspection costs, avoiding the main LSMR operational season (July through October), and installing education signage in the area. These impacts and mitigation measures are being drafted into a Memorandum of Agreement (MOA) between the affected parties. As of this writing, the MOA is being drafted; the MOA will be available upon request once complete.

The proposed Project is in an area that is culturally significant to the Anishinaabe. Spirit Island lies just downstream of Mud Lake and is central to their migration story. Parts of the proposed Project are within the viewshed of Spirit Island so there would be temporary visual impacts while equipment is on site. To help avoid other impacts, staff from Fond du Lac Band of Lake Superior Chippewa's Tribal Historic Preservation Office have been involved in planning through Section 106 involvement and as a part of design team and stakeholder meetings. Natural resources staff from Fond du Lac and 1854 Treaty Authority are also on the stakeholder team.

SHPO was contacted in August 2023 regarding any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to Mud Lake. SHPO indicated that its database did not show any archaeologic records for the given area.

16. Visual:

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

Scenery at the proposed Project area includes views of the wetland and aquatic ecosystems of Mud Lake and the St. Louis River, including associated wildlife. The scenery also includes the railroad causeway bisecting Mud Lake, a CN rail line along the southern edge, as well as the Oliver Bridge carrying vehicles and trains across the St. Louis River to the southeast. Views of construction operations would temporarily impact the visual landscape of the site, but visual impacts would cease upon Project completion.

Effects from vapor plumes or glare from intense light are not anticipated. Construction is not anticipated outside of daylight hours so intense lighting would not be needed. No mitigation is proposed.

As stated in Section 15, Spirit Island lies just downstream of Mud Lake and is central to the Anishinaabe migration story. Parts of the project are within the viewshed of Spirit Island, so there would be temporary visual impacts while equipment is on site. To help avoid other impacts, staff from Fond du Lac Band of Lake Superior Chippewa's Tribal Historic Preservation Office have been involved in the project planning through Section 106 involvement and as a part of design team and stakeholder meetings. Natural resources staff from Fond du Lac and 1854 Treaty Authority are also on the stakeholder team. No mitigation is proposed.

17. Air:

a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

The proposed Project does not include stationary emission sources.

b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Effects on air quality would arise from combustible engine emissions on tugs, excavators, dump trucks, and dredges used to load, transport, and place materials at the proposed Project. All equipment used by the contractor involved in the movement of dredged material to beneficial use sites must meet emissions standards; therefore, minor emissions are expected. Construction-related emissions would be exempt as *de minimis* and they would meet the conformity requirements under Section 176 (c) of the Clean Air Act, and 40 CFR 93.153. Emissions would be minor and temporary in nature, arising from the use of powered equipment during construction. Fuel exhaust emissions contain pollutants including carbon monoxide, nitrogen oxides, reactive organic gases, sulfur dioxide, and suspended particulate matter, all of which carry some associated health risks.

The Proposer would encourage the selected contractor to implement the following practices to reduce emissions from construction:

- Minimizing idling equipment
- Practice vehicle and equipment maintenance
- Utilize energy efficient lighting for construction
- Carpooling to the site by equipment operators

c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 17a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

The proposed Project may create some temporary dust during open-water season construction activities. Fugitive dust could arise from light vehicle traffic at the proposed Project site in association with maintenance operations of equipment and stockpile locations. Activities with the potential to create dust include material removal, stockpiling, placement, grading, and compacting. Dust generation is expected to be minimal because the material used consists of saturated sediment, sand, gravel, and rip rap.

The contractor would be required to follow best management practices to reduce dust during construction such as:

- Covering transport loads during the open-water season.
- Watering exposed soils if fugitive dust becomes an issue.
- Using BMPs on exposed areas and stockpiles.
- Requiring any materials transported onto the Project site to be clean and free of dirt and debris.

Unpleasant odors may be associated with the excavation of muck. Hydrogen sulfide is a byproduct of anaerobic respiration and is responsible for the "rotten egg" smell related to decomposed organic

matter, often associated with wetlands and aquatic environments. During the excavation and transport of the muck, this odor and other organic odors may be present in the vicinity of the proposed Project. If windy conditions are present, the odor is anticipated to disperse readily. The odors are anticipated to be temporary in nature; no long-term odor impacts are anticipated.

18. Greenhouse Gas (GHG) Emissions/Carbon Footprint

a. GHG Quantification: For all proposed projects, provide quantification and discussion of project GHG emissions. Include additional rows in the tables as necessary to provide project-specific emission sources. Describe the methods used to quantify emissions. If calculation methods are not readily available to quantify GHG emissions for a source, describe the process used to come to that conclusion and any GHG emission sources not included in the total calculation.

GHG emissions related to the proposed Project include those associated to construction. No operational GHG emissions are anticipated, as no permanent GHG emission producing infrastructure is proposed. Construction is anticipated to begin on or after July 1, 2025, and would be completed by November 2026. For this assessment, construction GHG emissions include:

- On-road vehicle emissions (haul trucks, etc.).
- Off-road vehicle emissions (earthmoving equipment such as excavators, loaders, etc.).

On-road vehicle emissions include those generated by the haul trucks, which would haul material from the dewatering facility to disposal locations (estimated 20 miles round trip). This operation is estimated to consist of two trucks per day for six months. Trucks are assumed to be in operation from 7:00 am to 7:00 pm. Carbon emissions related to the on-road vehicle emissions is estimated to be 19.5 metric tons.

Table 5. On-road vehicle emissions

EQUIPMENT FACTORS[1]		
On-road Equipment	Passenger Cars - Workers	Diesel Haul Trucks
Vehicles / day	5	2
Fuel type	Gas	Diesel
Days	300	160
Miles / day	20	20
Miles	30,000	6,600
Miles / gallon	25	7.6
Estimated gallons	1,200.0	868.4
EMISSION FACTORS		
CO_2 (kg/gal)	8.78	10.21
CH_4 (g/gal)	0.0054	0.0095
N_2O (g/gal)	0.0018	0.0431
EMISSIONS		
CO_2 (MT)	10.5	8.9
CH_4 (MT)	0.0004	0.00006
N_2O (MT)	0.00005	0.0003
CO_2e^2 (MT)	10.6	9.0
TOTAL: 19.6		

[1] EPA Emission Factors for Greenhouse Gas Inventories Tables 2, 3 and 4.

[2] CO2e emissions calculated using Global Warming Potentials from 40 CFR Part 98 Subpart A Table A-1 (CO2e= 1*CO2+25*CH4+298*N2O).

Off-road vehicle emissions include those generated by construction equipment that would remain on the proposed Project site for the duration of construction. This includes earthmoving equipment such as excavators and loaders and/or water-based equipment such as boats, tugs, and pumps. There are potential differences in the specific equipment utilized based on the contractor selected to complete the work. For the purposes of this assessment, it is assumed that two diesel-powered off-road construction vehicles would be in operation during the construction period. Estimates are provided for two land-based construction vehicles and two water-based construction vehicles.

The off-road vehicle emissions would be in operation for the duration of the construction of the proposed Project. For the purposes of this assessment, the USACE design engineer estimated the number of hours needed by each equipment to accomplish the work tasks. It is not assumed that the equipment is working every day during the construction timeline.

According to this GHG assessment for the proposed Project, carbon emissions related to the land-based construction vehicles emissions is estimated to be 359.52 metric tons; carbon emissions related to the water-based construction vehicle emissions is estimated to be 394.85 metric tons. This comes to a total of 753.85 metric tons for all off-road equipment.

Table 6. Off-road vehicle emissions

EQUIPMENT FACTORS[1]		
Off-road Equipment	Diesel Ships & Boats	Diesel Construction Equipment
Number of Vehicles	2	2
Consumption Rate (gal/hr per hp-hr)	0.05	0.05
Engine Size (hp)	125	125
Hours	2,760	3,000
Total Gallons	34,500	37,500
EMISSION FACTORS		
CO_2 (kg/gal)	10.21	10.21
CH_4 (g/gal)	6.41	1.01
N_2O (g/gal)	0.17	0.94
EMISSIONS		
CO_2 (MT)	352.245	382.875
CH_4 (MT)	0.221	0.038
N_2O (MT)	0.006	0.035
CO_2e[2] (MT)	359.52	394.33
TOTAL: 753.85		

[1] EPA Emission Factors for Greenhouse Gas Inventories Tables 2 and 5.

[2] CO2e emissions calculated using Global Warming Potentials from 40 CFR Part 98 Subpart A Table A-1 (CO2e= 1*CO2+25*CH4+298*N2O).

b. GHG Assessment

i. Describe any mitigation considered to reduce the project's GHG emissions.

No mitigation to reduce the proposed Project's GHG emissions is proposed. Construction-related emissions would be exempt as *de minimis* and they would meet the conformity requirements under Section 176 (c) of the Clean Air Act, and 40 CFR 93.153. Predicted GHG emissions related to the proposed Project are limited to those generated during construction. No operational GHG emissions are anticipated. The Proposer would encourage the selected contractor to reduce GHG emissions from construction, which may include:

- minimizing idling equipment;
- practice vehicle and equipment maintenance;
- utilize energy efficient lighting for construction; and
- encouraging carpooling to the site by equipment operators.

ii. Describe and quantify reductions from selected mitigation, if proposed to reduce the project's GHG emissions. Explain why the selected mitigation was preferred.

Not applicable.

iii. Quantify the proposed projects predicted net lifetime GHG emissions (total tons/#of years) and how those predicted emissions may affect achievement of the Minnesota Next Generation Energy Act goals and/or other more stringent state or local GHG reduction goals.

The GHG assessment indicates the proposed Project may generate 773.3 metric tons of emissions during construction. No operational emissions are planned. Over the course of the 50-year net lifetime of the project, these emissions equate to 15.5 metric tons per year. This accounts for 0.000011% of the state of Minnesota's 2020 emission and the Next Generation Act (NGA) goals.

Description	CO_2e (tons)
Project First Year Total Emissions	773.3
2020 MN Emission & Next Generation (NGA) Goal[5]	140,000,000
Project's First Year Percentage of NGA Goal	0.00055%
Project Annual Emissions/50 Year Net Lifetime	15.5
Project's Annual Lifetime Percentage of NGA Goal	0.000011%

19. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Minnesota Rules, part 7030.0040 establishes two noise levels, L10 and L50, based on the percent of time noise levels exceed the standard over a one-hour time period: L10 is defined as "noise levels exceeding the standard for ten percent of the time for one hour (6 minutes/hour)" and L50 is defined as "noise levels exceeding the standard for 50 percent of the time for one hour (30 minutes/hour)." The rules also establish daytime and nighttime noise level standards based on Noise Activity Classification (NAC) levels. Minnesota Rules, part 7030.0050 defines NAC levels based on land uses as 1, 2, 3, or 4. NAC Level 1 includes residential areas while NAC 3 includes highways and rail lines.

Noise standards established for NAC Level 1 areas are as follows: daytime standards (7:00 am to 10:00 pm) for the respective L levels are 65 decibels (dBA) (L_{10}) and 60 dBA (L_{50}); and nighttime standards (10:00 pm to 7:00 am) are 55 dBA (L10) and 50 dBA (L50). According to the Federal Highway Administration (FHWA), the average noise level at 50 feet from an excavator is 81 dBA

[5] Greenhouse gas emissions in Minnesota 2005-2020 (state.mn.us).

(FHWA Construction Noise Handbook, Table 9.1). Sound decreases from a point source at a rate of six dBA for every doubling of distance from the source (MPCA Guide to Noise Control in Minnesota). The table below provides an estimated noise level as a function of distance, based on information from the FHWA handbook and the MPCA guide.

Table 7. Expected noise level at different distances from construction equipment.

Distance from Source (Feet)	Noise Level (dBA)	Notes/Reference
50	81	Average referenced for excavator/generator in Table 9.1, FHWA handbook
100	75	Calculated based on the MPCA guide
200	69	Calculated based on the MPCA guide
400	62	Calculated based on the MPCA guide
800	56	Calculated based on the MPCA guide

There are no residential neighborhoods or sensitive receptors adjacent to the proposed Project site. In Minnesota, there are a few homes approximately 500 feet to the south and west of the proposed Project boundary. In Wisconsin, there are several homes approximately 500 feet southeast of the proposed Project site; however, they are 1,000 feet or more from areas where work is planned, so noise impacts to their residences would be limited. Furthermore, the CN rail line runs within 300-feet of the Minnesota homes and is located between them and the proposed Project site. Numerous freight trains pass through both day and night, producing significant short-term noise. Noise leaving the proposed Project site would also be minimized by a 20-foot bluff and forest cover that spans the proposed Project boundary from the northwest to the west and around to the south.

The contractor would use construction equipment classified as “mobile equipment” such as cranes, dredges, and excavators, which operate in cycles of full power followed by reduced power. Typical sounds would include engine noise, sounds of metal on metal, and safety back-up alarms. Other activities on the site would include mechanical excavation, material handling and hauling, and ancillary work needed. The contractor would ensure that all construction equipment is fitted with the appropriate mufflers during each phase of the proposed Project and complete most work during daytime (7:00 am to 10:00 pm) hours to help maintain noise levels below the state standards. The contractor would also notify the homeowners about the intent of the proposed Project, duration, expected noise levels, and complaint procedures. Once complete, the proposed Project would not generate noise.

20. Transportation

a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

The proposed Project is exploring two access options. The first option accesses Mud Lake from Highway 23/Commonwealth Avenue through private property owned by U.S. Steel. This option does not utilize existing public parking spaces and does not propose any. Daily traffic would consist of 5-10 passenger vehicles used to transport workers from home to the jobsite in the morning and evening. Bus routes could get workers within 0.5 miles of the job site. Additional delivery of fuel or

construction materials would add one or two additional trips per day. Once construction equipment is transported to the site, all construction traffic would remain on private roads. Additional trucking on public roads would likely occur to transport the dewatered sediment off-site for disposal or reuse. Transporting material off-site would involve approximately 24 truckloads each day for 180 days. The loads would be spread out over the course of the day.

The second option accesses Mud Lake from McCuen Street through private property owned by the City of Duluth, CN Railroad, and U.S. Steel. There are parking areas for up to 10 vehicles off of McCuen Street utilized by the public. These spaces could be utilized for construction equipment and staging. No additional parking spaces are proposed. Daily traffic would consist of 5-10 passenger vehicles used to transport workers from home to the jobsite in the morning and evening. Bus routes could get workers within 0.6 miles of the job site. Additional delivery of fuel or construction materials would add one or two additional trips per day. Once construction equipment is transported to the site, all construction traffic would remain on private roads. Additional trucking would likely occur on public roads to transport the dewatered sediment off-site for disposal or reuse. Transporting material offsite would involve approximately 24 truckloads each day for 180 days. The loads would be spread out over the course of the day.

b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 *(available at: http://www.dot.state.mn.us/accessmanagement/resources.html)* or a similar local guidance,

No proposed Project-related congestion is expected, and the proposed Project would not generate an additional 250 vehicles or 2,500 trips per day on affected roads. During construction, about 15 vehicles would access the worksite per day, growing to 25-30 vehicles during dewatered material transport. This includes workers' personal vehicles, heavy equipment and fuel delivery, and dump trucks hauling material. Much of the vehicle traffic would occur on private roads during construction. The proposed Project would not have an impact on the regional transportation system.

c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

No effects on the transportation system are expected as a result of the proposed Project, and mitigation is not proposed. The Proposer and its contractors would discuss any concerns at the start of construction and coordinate with the MN Department of Transportation, Wisconsin Department of Transportation, and City of Duluth transportation authorities.

21. Cumulative potential effects: (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

Mud Lake is a 120-acre shallow sheltered bay of the St. Louis River located near the Gary New Duluth neighborhood of Duluth, Minnesota. The proposed Mud Lake Project would take place in the upper reaches of the lower St. Louis River (see Attachment 1: Figure 1). The proposed Project area includes the surrounding wetlands and some of Steelton Bay to the northeast, for a

total of 280 acres (see Attachment 1: Figure 2 and Figure 4).

Construction is anticipated to begin in summer 2025 and would be complete by the end of 2026. Construction timing and phasing would be determined by the contractor (contract not yet awarded) within the requirements and specifications of the contract, permits, and landowner access agreements. The proposed Project construction would occur over two seasons due to complexities involving site access and staging, as well as seasonal construction restrictions due to winter ice cover and the fish spawning exclusion from April 1-June 30. Additionally, to avoid adverse effects to the northern long-eared bat and spring/summer nesting birds, trees would be removed between November 15th and March 31st, outside the active season for the bat and nesting season for birds.

Environmental effects related to this project will be temporary during the construction period of 2025-2026. These short-term effects would include:

- Water quality: During the excavation and placement of sediment and for several days after actions have concluded, total suspended sediment would be elevated in the proposed Project area's water column. The short-term water quality impacts may include turbidity in the water column due to sediment disturbance at the location where the material is excavated or placed. During construction there is the potential for stormwater runoff effects near construction access points. As described in Item 12.b.ii, the contractor would use typical erosion and sediment control BMPs to prevent mobilization of all material into nearby water resources, thereby limiting the geographic area of this effect to the proposed Project area; any effects outside of the proposed Project area are expected to be negligible and are, therefore, unlikely to combine with other environmental effects.
- Water quantity: The contractor would use an estimated one million gallons of water from the St. Louis River to hydraulically dredge sediment and to transport dredged sediment to the dewatering area and coastal marsh creation component. This is expected to take 50 days, and all water would be returned to the St. Louis River. The geographic area of this effect would be primarily limited to the proposed Project area; any effects outside of the proposed Project area are expected to be negligible in time and geography, and are therefore, unlikely to combine with other environmental effects.
- Fish and wildlife habitat: The proposed Project would have temporary impacts to fish and wildlife communities within the proposed Project area during construction. Temporary impacts may include displacement due to increased activity and noise levels during construction within the 280 acres of both aquatic and terrestrial environments of the proposed Project area. Dredging activities may cause harm to fish, macroinvertebrates, and other wildlife that cannot easily move to other areas within the 275.6 acres of aquatic environments of the proposed Project area, while any effects outside of the proposed Project area are expected to be negligible and are, therefore, unlikely to combine with other environmental effects.

Post-construction, long-term environmental effects related to this project would include:

- Soils and topography: The proposed Project would dredge a total of 100,500 cubic yards of material from 17.5 acres of the proposed Project site; 4,100 cubic yards containing contaminants and the remaining 96,400 cubic yards of uncontaminated material being suitable for beneficial reuse in upland or aquatic environments. An estimated 15,000 cubic yards of the uncontaminated material from RU3 would be reused on site to create 3 acres of coastal marsh habitat in RU5, and most of the 25,500 cubic yards of dredged material from RU4 would be side cast to form habitat mounds.
    - Within the proposed Project area, the total dredge quantity for each RU (see Attachment 1: Figure 3) is proposed to include:

    - RU2: 35,000 cubic yards (6 acres)
    - RU3: 40,000 cubic yards (5 acres)
    - RU4: 25,500 cubic yards (6.5 acres)

  The geographic area of this effect would be limited to the proposed Project area; any effects outside of the proposed Project area are expected to be negligible and are, therefore, unlikely to combine with other environmental effects.
- Contaminated sediment: The proposed Project would excavate approximately 4,210 cubic yards of sediment contaminated with dioxins/furans and some heavy metals across 6 acres in RU2 (see Attachment 1: Figure 3). This sediment would be isolated from the St. Louis River during excavation. The contractor would process the contaminated dredged soils in a separate area within the dewatering area west of Mud Lake within the proposed Project area. All water coming from the dewatering process would be treated in a temporary water treatment plant before being returned to the St. Louis River. The contaminated sediments would be properly disposed of at an approved local landfill. The contaminated sediments dredged for the proposed Project do not meet the definition of hazardous waste. The geographic area of this effect would be primarily limited to the proposed Project area; any effects outside of the proposed Project area are expected to be negligible and are, therefore, unlikely to combine with other environmental effects.
- Wetlands: The new channel (RU2) and hemi-marsh (RU4) components would deepen portions of the open water wetlands through excavation of vegetation and sediments; however, the depths post-project would remain less than 6.6 feet deep, which remains within the shallow open water classification. The coastal marsh (RU5) component would convert 3 acres of lake to shallow open water wetland by creating depths ranging from 1-3 feet with the placement of dredged material from RU3. The deep-water (RU3) component would deepen 5 acres of lake but would not change the classification. No wetlands or aquatic resources would be converted to upland. Vegetation communities would change in RU's 2, 4, and 5. In RU's 2 and 4, emergent hybrid/narrowleaf cattails would be replaced with a more diverse mix of native emergent and submerged species. RU5 currently has areas with submerged vegetation but would support mainly emergent vegetation once complete. The loss of vegetative cover would be temporary following construction. A planting plan would be created to specify areas where seeding, planting, installation of plugs, or natural recruitment would take place. The geographic area of this effect would be limited to the proposed Project area; any effects outside of the proposed Project area are expected to be negligible and are, therefore, unlikely to combine with other environmental effects.
- Surface waters: RU3 would convert 5 acres of mid-depth open water (5-6 feet) to deep water depths (10+ feet) by excavating 40,000 cubic yards of sediment. RU5 would convert 3 acres of shallow to mid-depth open water to shallow open water wetlands by placing 15,000 cubic yards of material dredged from RU3. The excavation of the railroad causeway in RU1 would also create an additional 0.1 acres of open water. There would be minimal loss of vegetation by deepening open water in RU3 because the area is already too deep to support vegetation. The RU5 area currently holds sparse vegetation but would support widespread coverage of emergent vegetation once complete. The geographic area of this effect would be primarily limited to the proposed Project area; any effects outside of the proposed Project area are expected to be negligible and are, therefore, unlikely to combine with other environmental effects.

Environmental effects resulting from the proposed Project related to land use, visual, air, greenhouse gas emissions, noise, and transportation are expected to be negligible in both the short- and long-term, and are, therefore, unlikely to combine with other environmental effects.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

The Proposer contacted U.S. Steel, as they are the primary landowner near the proposed Project site. They do not have any reasonably foreseeable future projects for 2025-2026. Based on information obtained from the City of Duluth, there is a possible commercial project to the north of the proposed Project area; however, there is no timeframe or geographic scope for the commercial project yet. Additionally, the Wisconsin DNR is planning the Crawford Creek Habitat Restoration project, which would remediate contaminated sediments and restore habitat within stream, wetland, and floodplain. This proposed project is located approximately 16 river miles from Mud Lake and is not scheduled to begin until 2027 or later. As a result, the potential commercial project and the Crawford Creek Habitat Restoration project do not have the potential to interact with environmental effects of the proposed Mud Lake Project within the geographic scales and timeframes identified above.

The U.S. Environmental Protection Agency (EPA) is planning a dredging project in Tallas Bay, 5 miles downstream, along the St. Louis River, of the proposed Mud Lake Project, at the mouth of Knowlton Creek. The EPA anticipates construction to begin during the summer of 2026. The project would remove approximately 10,000 to 15,000 cubic yards of material, most of which was deposited in Tallas Bay after two culverts failed in Knowlton Creek during the 2012 flood.

The EPA's project is expected to occur within the same timeframe as the proposed Mud Lake Project, as identified above. However, the EPA's project is 5 miles downstream of the proposed Mud Lake project. As a result, the short- or long-term environmental effects resulting from the proposed Mud Lake Project are not expected to interact with the EPA project's temporary environmental effects. In the long-term, the environmental effects of both projects would contribute towards the goal of delisting the SLRAOC by 2030.

c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

In the short-term, during the construction period of the proposed Mud Lake Project, there are no reasonably foreseeable future projects that could combine with the environmental effects from the proposed project within the same geographic scales and timeframe of the proposed project to create potential effects greater than those from the proposed project.

Long-term, the proposed Project is expected to improve hydrologic connectivity, reestablish deep-water habitat, reduce hybrid/narrowleaf cattail monoculture, and restore/enhance critically imperiled coastal wetland habitat within the proposed Project area. The long-term effects associated with completion of the proposed Mud Lake Project and the EPA's project would contribute towards the goal delisting the SLRAOC by 2030.

22. Other potential environmental effects: If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

There are no other known or potential environmental effects that were not discussed in EAW items 1 through 21.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*
I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature Caroline Oswald Digitally signed by Caroline Oswald Date: 2025.04.10 11:25:42 -05'00' Date 04/10/2025

Title Project Manager

References

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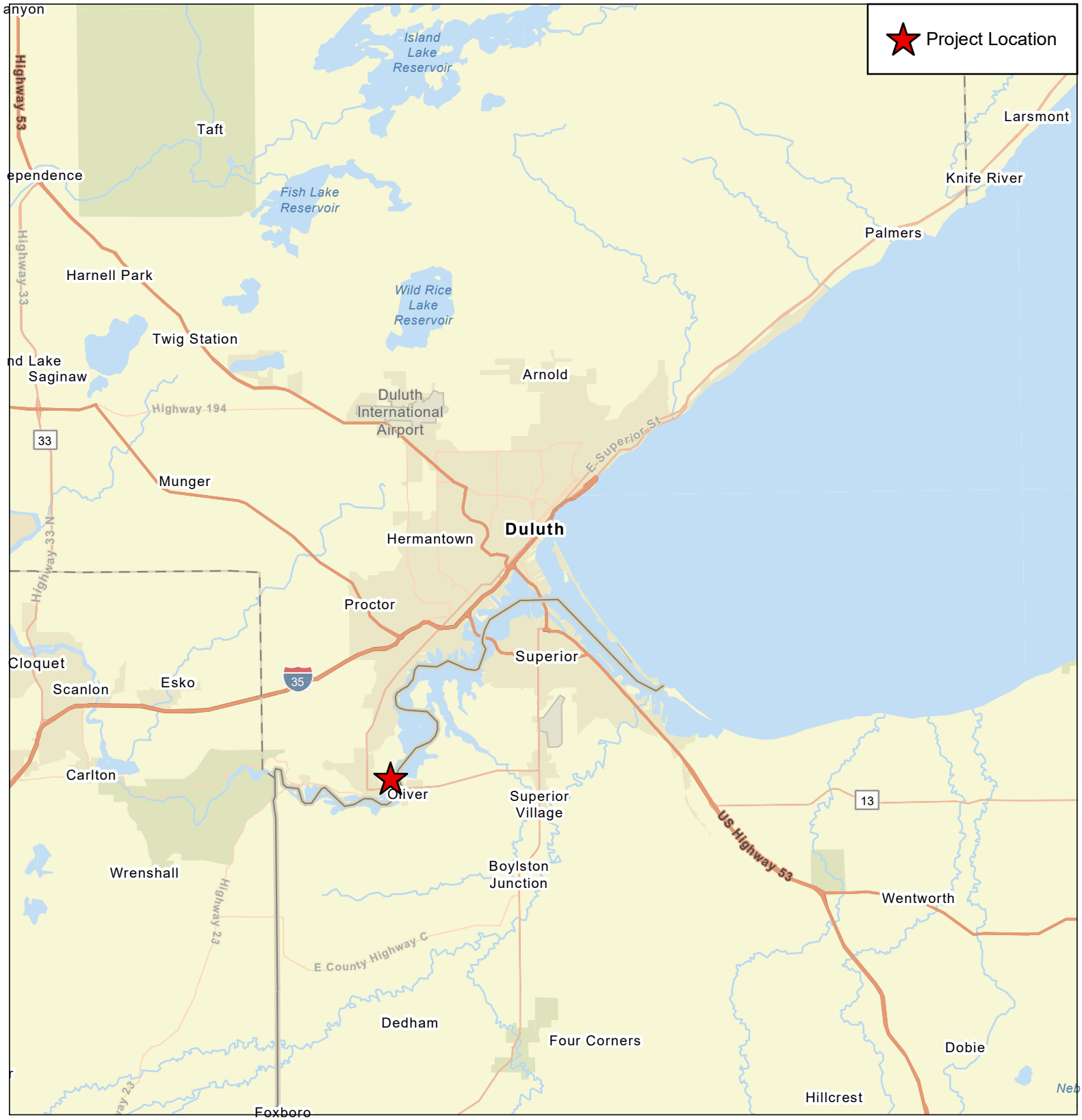
Attachment 1

Figure 1: Project Location



DEPARTMENT OF NATURAL RESOURCES

Date: November 21, 2024

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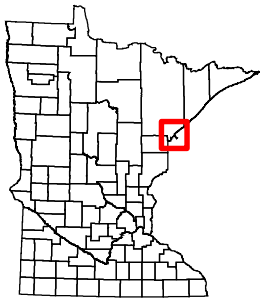
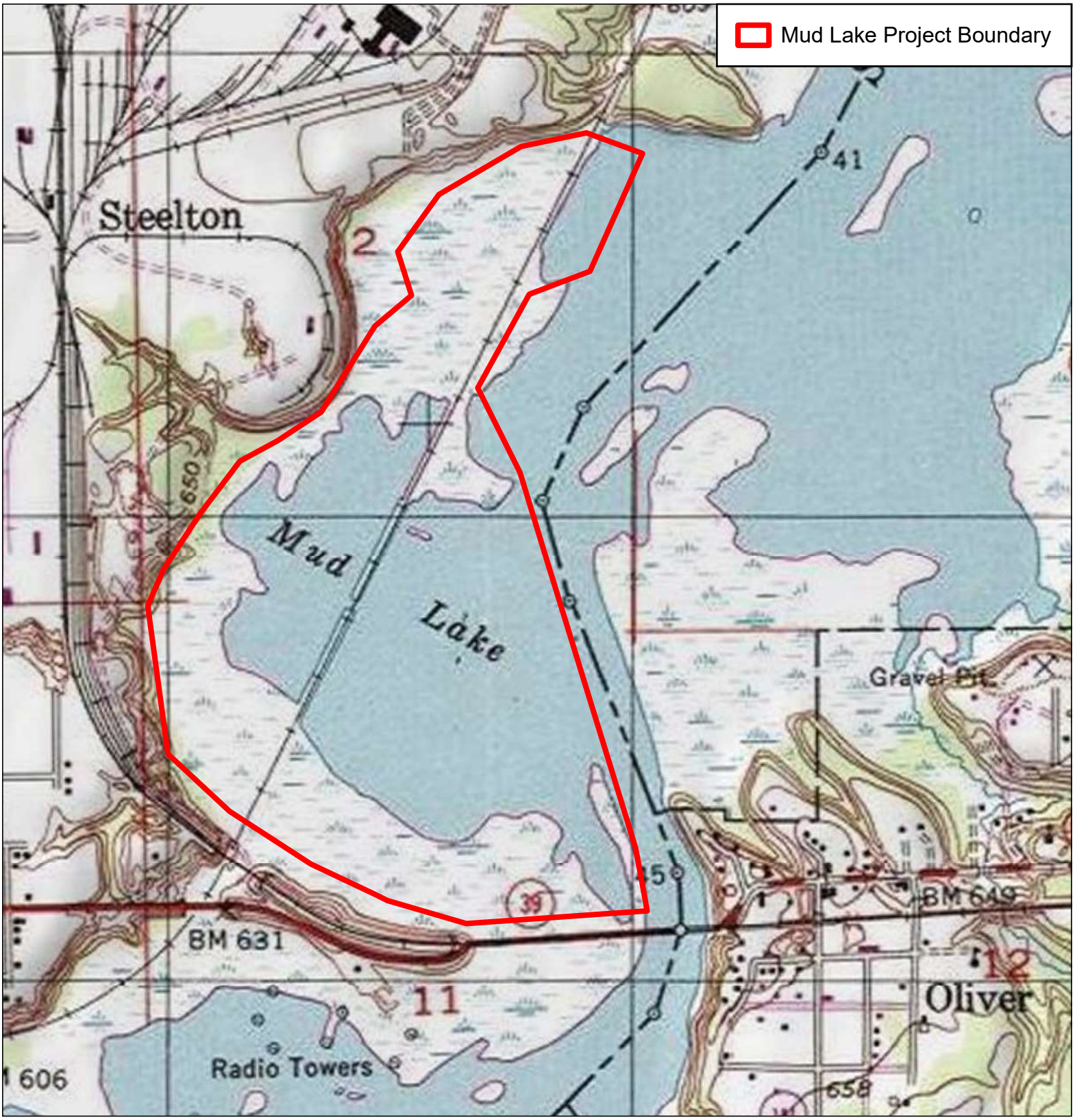


Figure 2: Topographic Map



DEPARTMENT OF NATURAL RESOURCES

Date: November 21, 2024

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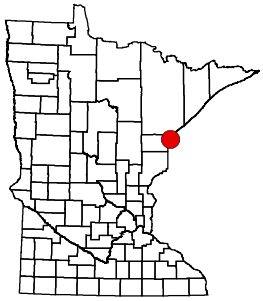
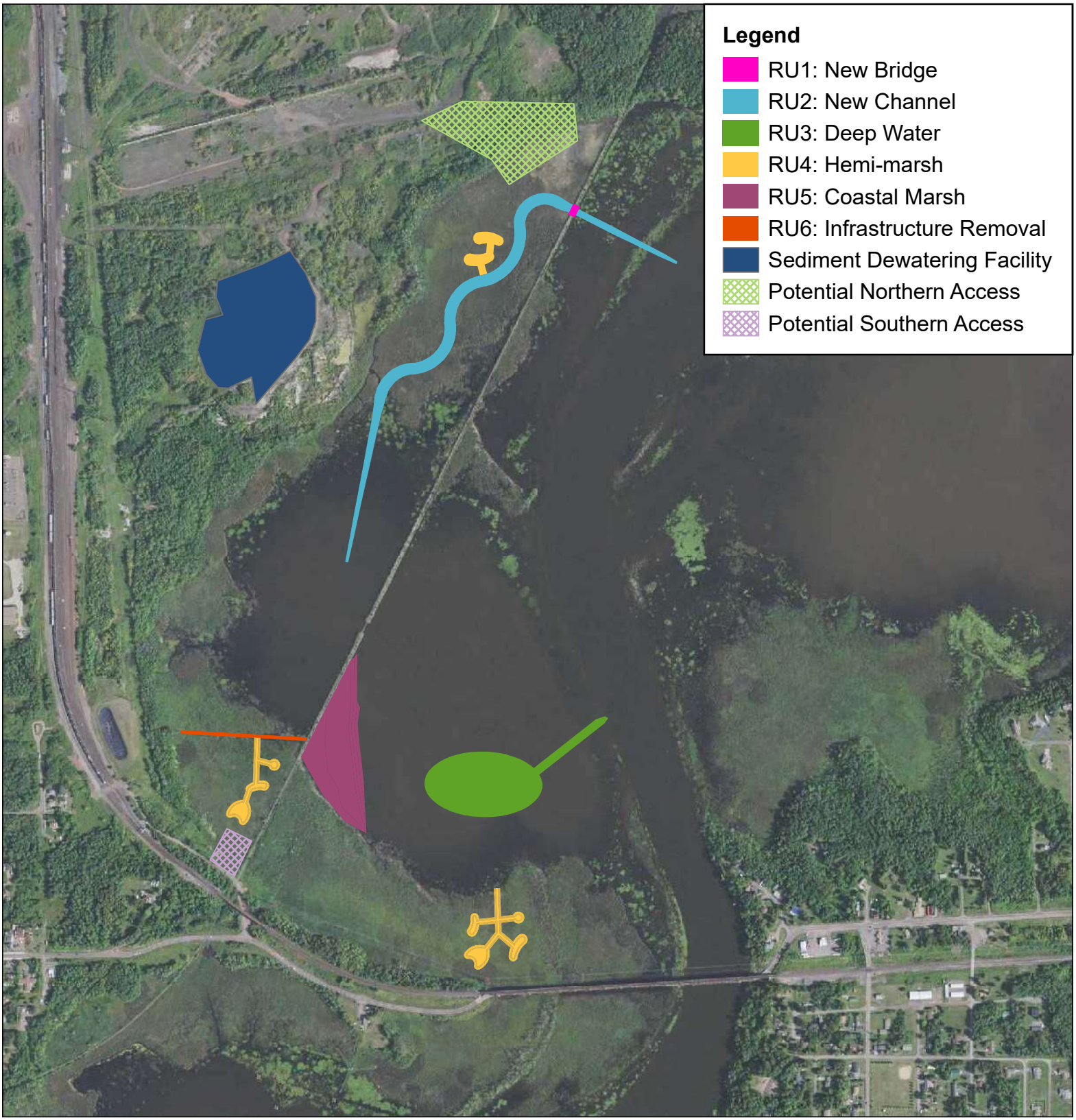


Figure 3: Project Components



DEPARTMENT OF NATURAL RESOURCES

Date: November 21, 2024

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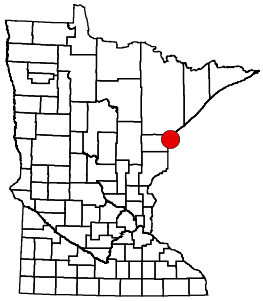
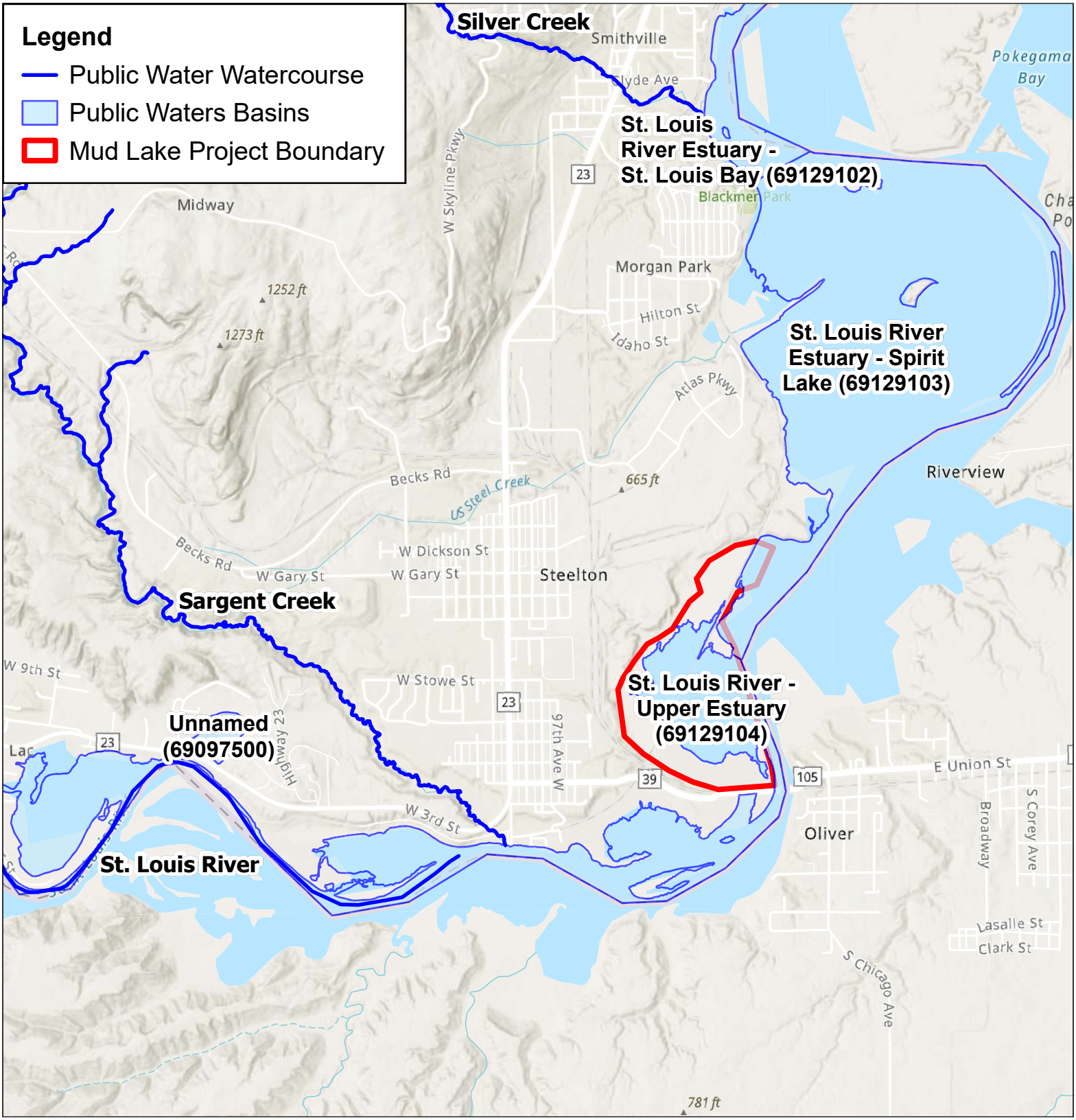


Figure 4: Local Geography



DEPARTMENT OF NATURAL RESOURCES

Date: November 21, 2024

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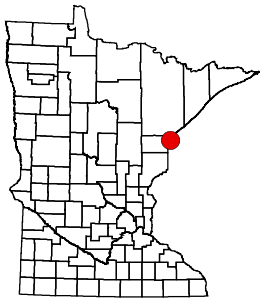
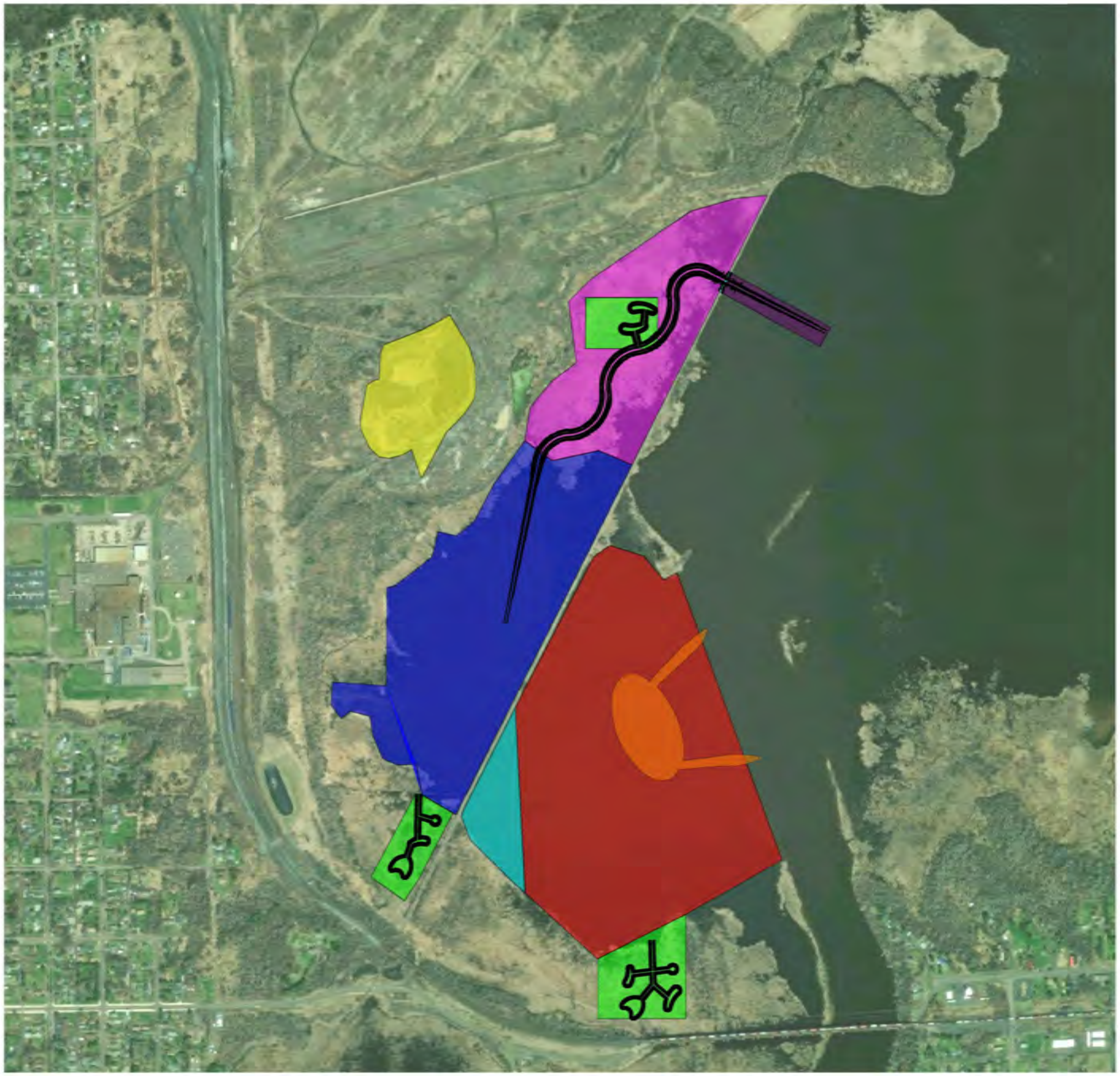


Attachment 2



A1 OVERALL RESTORATION UNIT SITES - PLAN

SCALE: 1"=400'

0 400' 800'

GENERAL SHEET NOTES

1.

LEGEND

- RU #1: OPEN WATER, EAST
- RU #2: COASTAL WETLAND
- RU #3: HEMI-MARSH
- RU #4: OPEN WATER, WEST
- RU #5: HYDROLOGIC CONNECTION AND HABITAT
- RU #6: DEEP WATER
- RU #7: SEDIMENT DEWATERING FACILITY
- RU #8: CAUSEWAY BRIDGE
- RU #9: OPENWATER, NORTH

US Army Corps of Engineers®

MARK | DESCRIPTION | DATE

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

DESIGNED BY: E. MALBURG
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PHILL ROSS
SIZE: ANSI D
ISSUE DATE: 12JULY2024
SOLICITATION NO.: W911XX
CONTRACT NO.: W911XX
%UOPTION 1%
%UOPTION 2%
FY21 Mud Lake RAP_GI101.dgn

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

OVERALL RESTORATION UNIT SITES

SHEET ID

GI101

65% BCOES REVIEW

%PRODUCTION DATA 1%
%PRODUCTION DATA 2%
%PRODUCTION DATA 3%
%PRODUCTION DATA 4%

GENERAL SHEET NOTES

1. TOPOGRAPHIC SURVEY DATA OBTAINED BY USACE ON _____.
2. THE GRID COORDINATE SYSTEM REFERENCED SHOWN IS REFERENCED IN MINNESOTA STATE PLANE COORDINATE SYSTEM, LAMBERT PROJECTION, NORTH ZONE (2201), NORTH AMERICAN DATUM 1983 (NAD83), US SURVEY FEET.
3. CONTRACTOR MUST SUBMIT A SEDIMENT DEWATERING WORK PLAN INCLUDING DEWATERING CONTAINMENT PAD AS SPECIFIED IN SPECIFIED SECTION 35 20 25.
4. CLEARING AND GRUBBING OF DEWATERING AREA SHALL BE PERFORMED AS NECESSARY IN ACCORDANCE WITH SPECIFICATION 31 11 00.
5. THE DREDGE MATERIAL PROCESSING AND WATER TREATMENT AREAS AND LAYOUT SHOWN ARE CONCEPTUAL, THE CONTRACTOR MUST DETERMINE THE LAYOUT AND SUBMIT IT TO THE STATE FOR REVIEW AND APPROVAL. SEE SPECIFICATION SECTION 35 20 25.

LEGEND

- SITE ACCESS ROAD
- HAUL ROAD
- LIMITS OF CLEARING AND GRUBBING
- EXITSING MAJOR CONTOUR
- EXITSING MINOR CONTOUR
- APPROX. EXISTING LOCATION FOR HYDRAULIC PIPELINE
- PROPOSED NON-CONTAMINATED SEDIMENT DEWATERING AREA (4.961 ACRES)
- PROPOSED WATER COLLECTION AND TREATMENT AREA (1.645 ACRES)
- PROPOSED CONTAMINATED SEDIMENT DEWATERING AREA (1.420 ACRES)
- PROPOSED CAT-TAIL VEGETATION DEWATERING AREA (0.590 ACRES)

A1 DEWATERING SITE DETAILS
SCALE: 1"=80'

0 80' 160'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: E. MAHLBERG
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PAUL HOSS
ANSI D

ISSUE DATE: ISSUE CODE: SOLICITATION NO.: W911XK CONTRACT NO.: W911XK

FY21 Mud Lake RAP_GC102.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

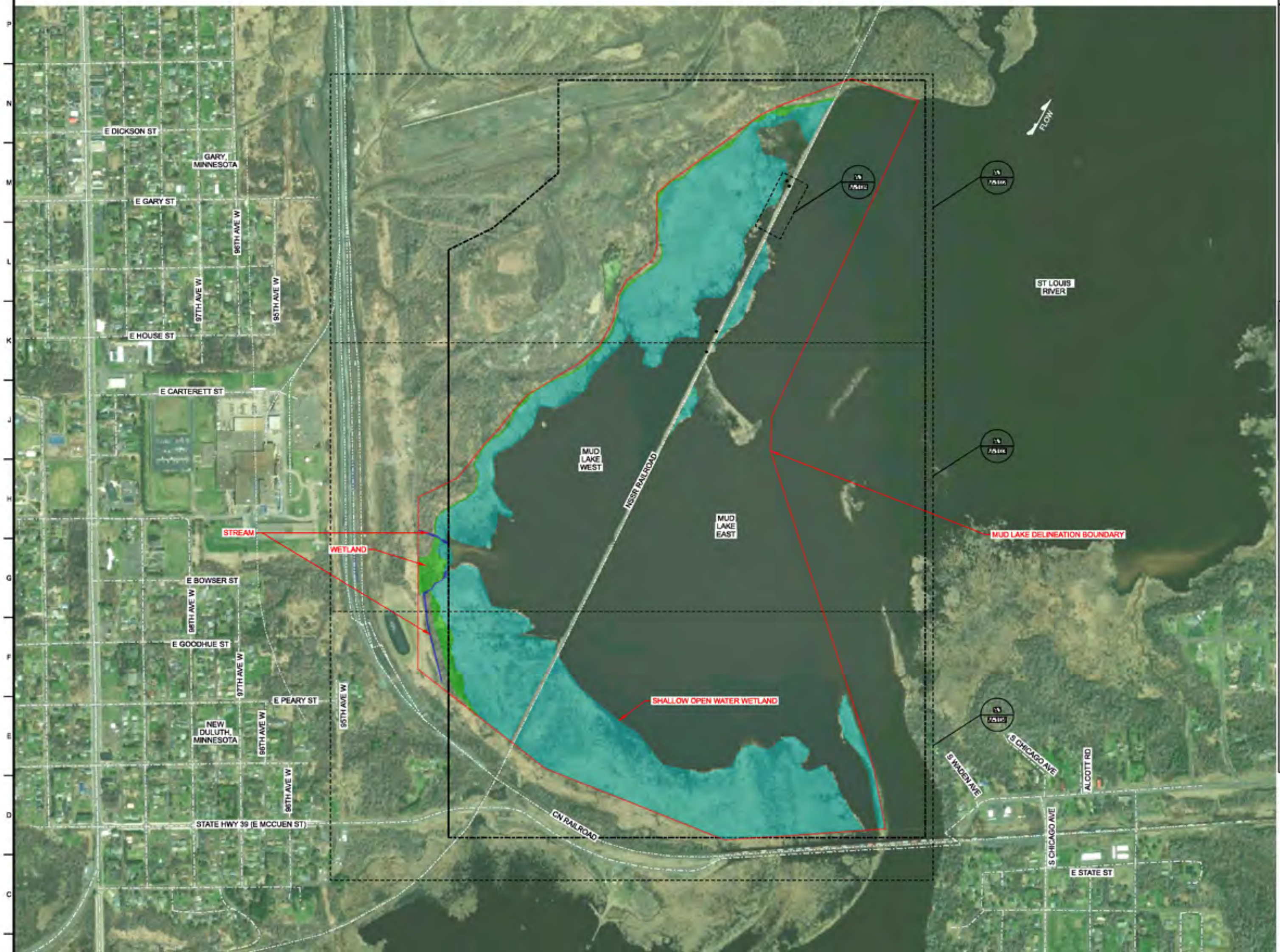
ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

DEWATERING SITE DETAILS

SHEET ID
GC102

65% BCOES REVIEW

PDs: FY21 Mud Lake RAP_GC102.dgn DS:
8:26:05 AM 7/12/2024



A1 EXISTING CONDITION
SCALE: 1"=400'

0 400' 800'

GENERAL SHEET NOTES

1.

LEGEND

ROAD CENTERLINE

RAILROAD CENTERLINE

CONTRACTOR WORK LIMITS

WETLAND

STREAM

SHALLOW OPEN WATER WETLAND

US Army Corps of Engineers®

MARK | DESCRIPTION | DATE

DESIGNED BY: E. MALBURG
DRAWN BY: K. VINCENT, M. ASKAR
CHECKED BY: T. SMITH
SUBMITTED BY: PHILL ROSS
SIZE: ANSI D
ISSUE DATE: 12JULY2024
SOLICITATION NO.: W911XX
CONTRACT NO.: W911XX
%UOPTION 1%
%UOPTION 2%
FY21 Mud Lake RAP V-101.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

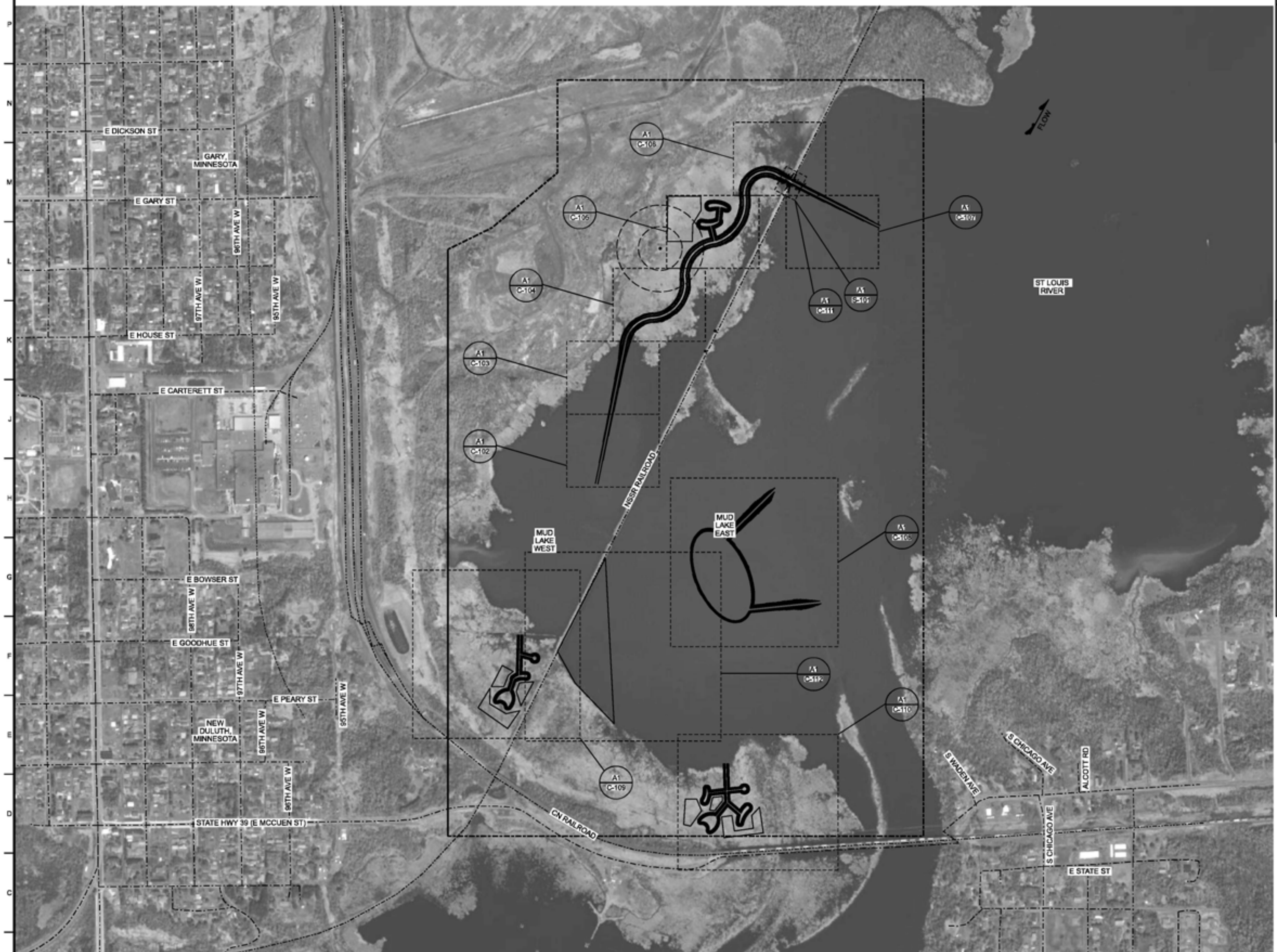
ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

GENERAL SITE PLAN

SHEET ID
V-101

65% BCOES REVIEW

%PRODUCTION DATA 1%
%PRODUCTION DATA 4%
%PRODUCTION DATA 3%
%PRODUCTION DATA 2%



A1 OVERALL REQUIRED WORK - PLAN

SCALE: 1"=400'

0 400' 800'

GENERAL SHEET NOTES

1.

LEGEND

— · — · —	ROAD CENTERLINE
— ·· — ·· —	RAILROAD CENTERLINE
— - — - —	CONTRACTOR WORK LIMITS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: E. MALBURG	ISSUE DATE: 12JULY2024
DRAWN BY: K. VINCENT, M. ASKAR	SOLICITATION NO.: W911XK
CHECKED BY: T. SMITH	CONTRACT NO.: W911XK
SUBMITTED BY: PHILL ROSS	
SIZE: ANSI D	FY21 Mud Lake RAP_C-101.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

OVERALL REQUIRED PLAN VIEW

SHEET ID

C-101

65% BCOES REVIEW

FY21 Mud Lake RAP_C-101.dgn
DS:
PD:
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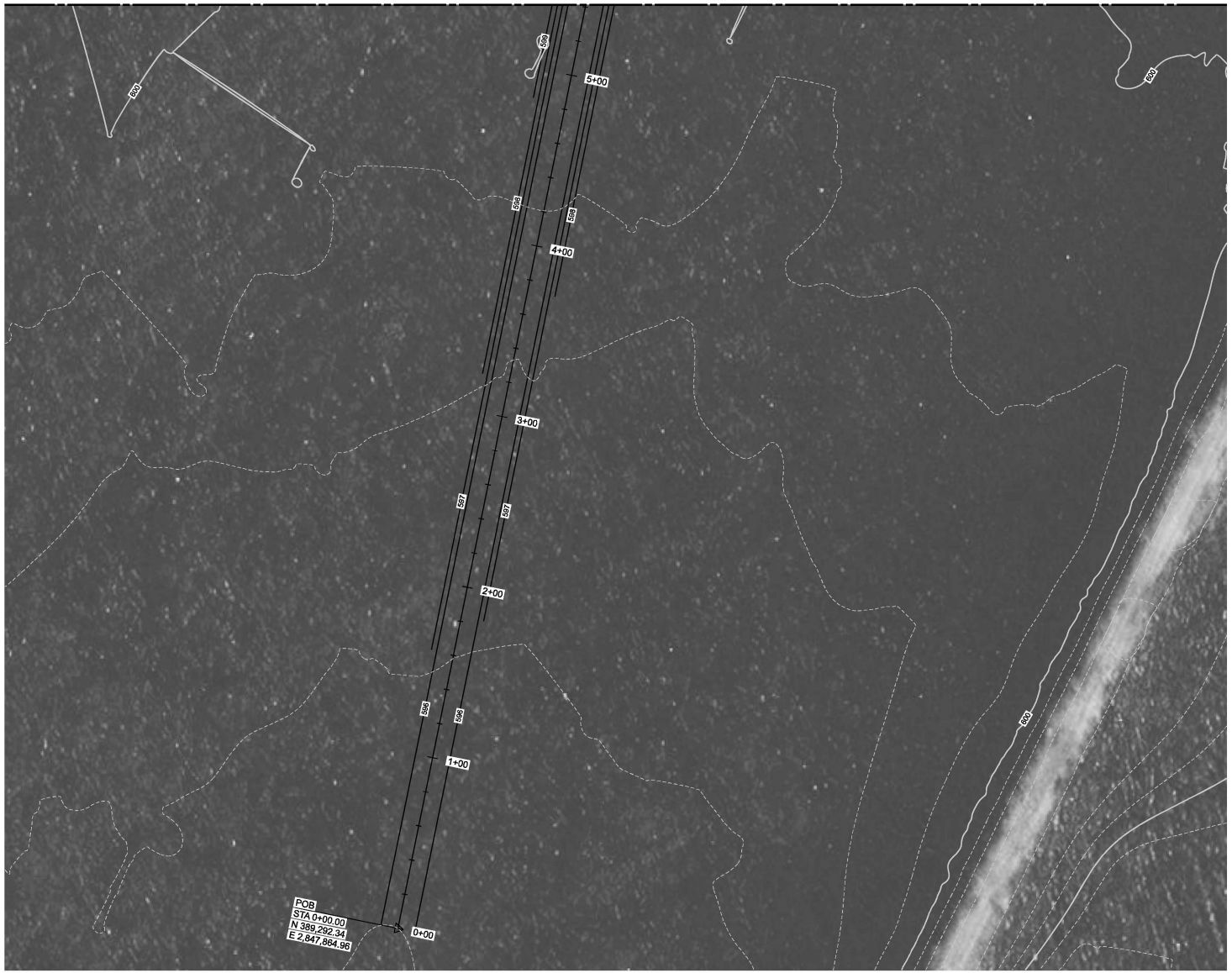


A1 REQUIRED CHANNEL PLAN VIEW
SCALE: 1"=30'

0 30' 60'

GENERAL SHEET NOTES

1.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

DESIGNED BY:	ISSUE DATE:
H. HASSEN	ISSUE CODE
DRAWN BY:	SOLICITATION NO.:
K. VINCENT	W911XK
CHECKED BY:	CONTRACT NO.:
T. SMITH	W911XK
SUBMITTED BY:	
PHIL KOSS	
SIZE	
ANSI D	FY21 Mud Lake RAP C-102.dgn

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED CHANNEL PLAN VIEW
(SHEET 01 OF 06)

SHEET ID
C-102

65% BCOES REVIEW

FY21 Mud Lake RAP_C-102.dgn
DS:
PD:
8:40:21 AM 7/12/2024

MATCHLINE C-104

MATCHLINE C-102

A1 REQUIRED CHANNEL PLAN VIEW

SCALE: 1"=30'

0 30' 60'

GENERAL SHEET NOTES

1.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

DESIGNED BY: H. BASHORE
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PHIL ROSS
SIZE: ANSI D
ISSUE DATE: 12JULY2024
SOLICITATION NO.: W911XX
CONTRACT NO.: W911XX
FY21 Mud Lake RAP_C-103.dgn

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

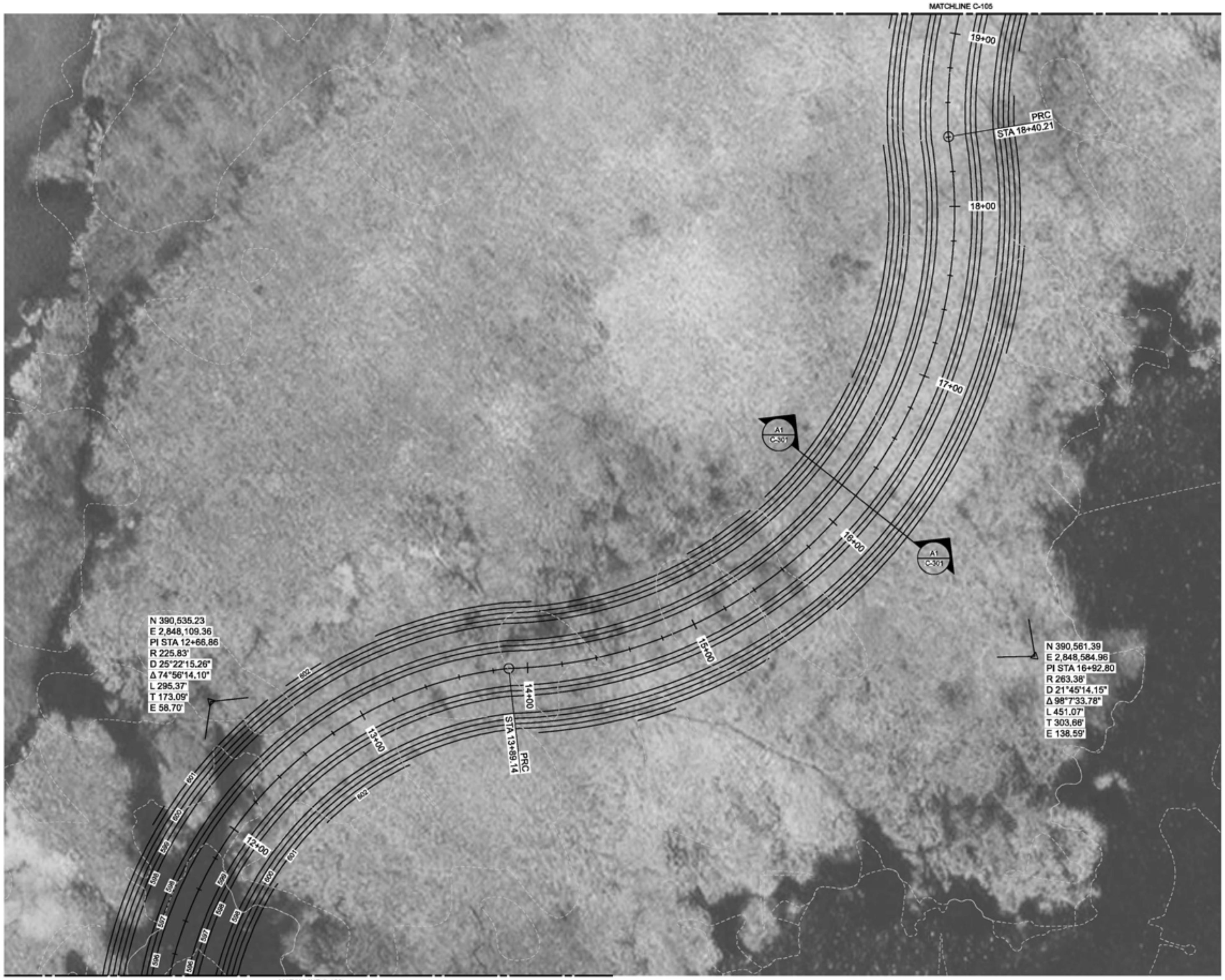
REQUIRED CHANNEL PLAN VIEW
(SHEET 02 OF 05)

SHEET ID
C-103

65% BCOES REVIEW

FY21 Mud Lake RAP_C-103.dgn
8:41:07 AM 7/12/2024

MATCHLINE C-105



MATCHLINE C-103

A1 REQUIRED CHANNEL PLAN VIEW
SCALE: 1"=30'

0 30' 60'

GENERAL SHEET NOTES

1.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

DESIGNED BY: H. BASHORE	ISSUE DATE: 12JULY2024
DRAWN BY: K. VINCENT	SOLICITATION NO.: W911XK
CHECKED BY: T. SMITH	CONTRACT NO.: W911XK
SUBMITTED BY: PHILL ROSS	
SIZE: ANSI D	FY21 Mud Lake RAP_C-104.dgn

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED CHANNEL PLAN VIEW
(SHEET 03 OF 06)

SHEET ID
C-104

65% BCOES REVIEW

FY21 Mud Lake RAP_C-104.dgn DS:
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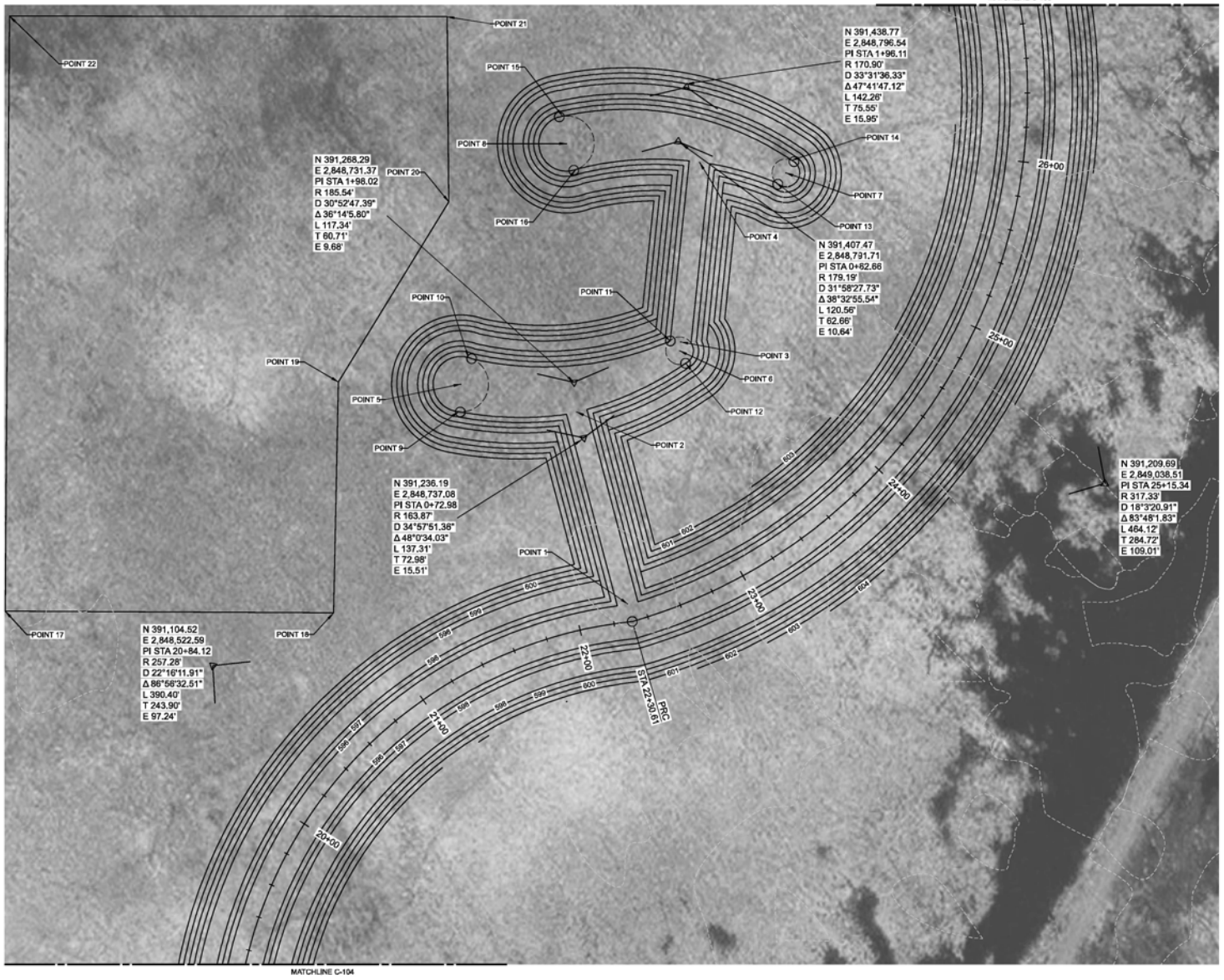
8:41:51 AM 7/12/2024



A1 REQUIRED CHANNEL PLAN VIEW
SCALE: 1"=30'

0 30' 60'

GENERAL SHEET NOTES

1.

POINT	X	Y
1	2848762	391140.3
2	2848733	391251.1
3	2848793	391291.6
4	2848804	391395.4
5	2848666	391267.2
6	2848793	391286.5
7	2848854	391389.3
8	2848727	391406.3
9	2848664	391251.3
10	2848672	391282
11	2848787	391292.2
12	2848796	391279.3
13	2848848	391383.7
14	2848857	391396.6
15	2848725	391422.2
16	2848734	391391.7
17	2848402	391136.1
18	2848592	391135.1
19	2848595	391268.5
20	2848659	391372.7
21	2848658	391479.7
22	2848405	391480.1

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:
DRAWN BY:
K. VINCENT
CHECKED BY:
T. SMITH
SUBMITTED BY:
ISSUE DATE:
SOLICITATION NO.:
W911XK
CONTRACT NO.:
W911XK
FILE NAME
FY21 Mud Lake RAP_C-105.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED CHANNEL PLAN VIEW
(SHEET 04 OF 05)

SHEET ID
C-105

65% BCOES REVIEW

FY21 Mud Lake RAP_C-105.dgn
DS:
PD:
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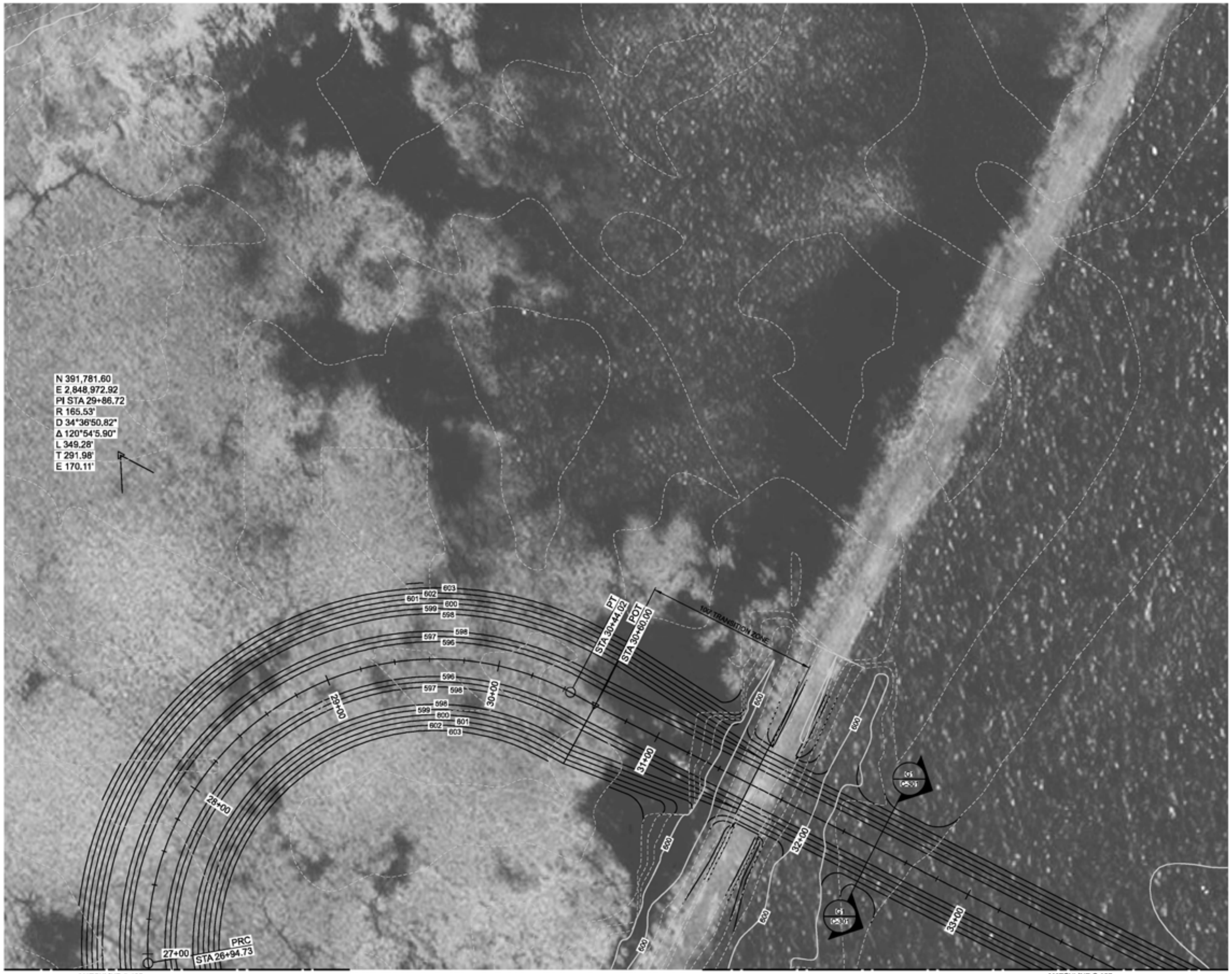
GENERAL SHEET NOTES

1.



A1 REQUIRED CHANNEL PLAN VIEW

SCALE: 1"=30'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: H. BASHORE
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PHILL ROSS
SIZE: ANSI D
ISSUE DATE: 12JULY2024
SOLICITATION NO.: W911XK
CONTRACT NO.: W911XK
FY21 Mud Lake RAP_C-106.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

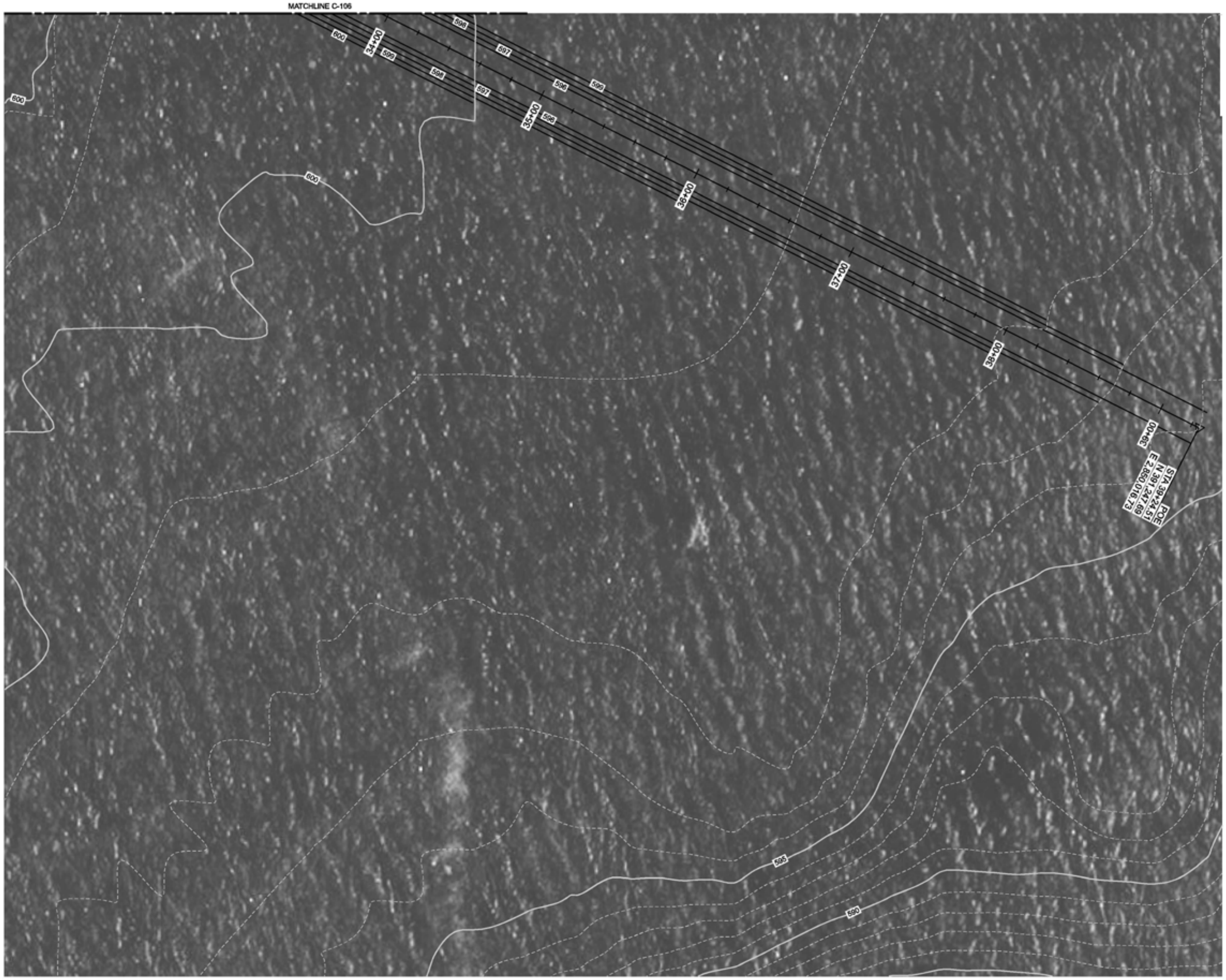
ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED CHANNEL PLAN VIEW
(SHEET 05 OF 05)

SHEET ID
C-106

65% BCOES REVIEW

FY21 Mud Lake RAP_C-106.dgn DS:
PD:
8:43:28 AM 7/12/2024



A1 REQUIRED CHANNEL PLAN VIEW

SCALE: 1"=30'

0 30' 60'

GENERAL SHEET NOTES

1.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

DESIGNED BY: H. BASHORE	ISSUE DATE: 12JULY2024
DRAWN BY: K. VINCENT	SOLICITATION NO.: W911XK
CHECKED BY: T. SMITH	CONTRACT NO.: W911XK
SUBMITTED BY: PHILL ROSS	
SIZE: ANSI D	FY21 Mud Lake RAP_C-107.dgn

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED CHANNEL PLAN VIEW
(SHEET 06 OF 05)

SHEET ID

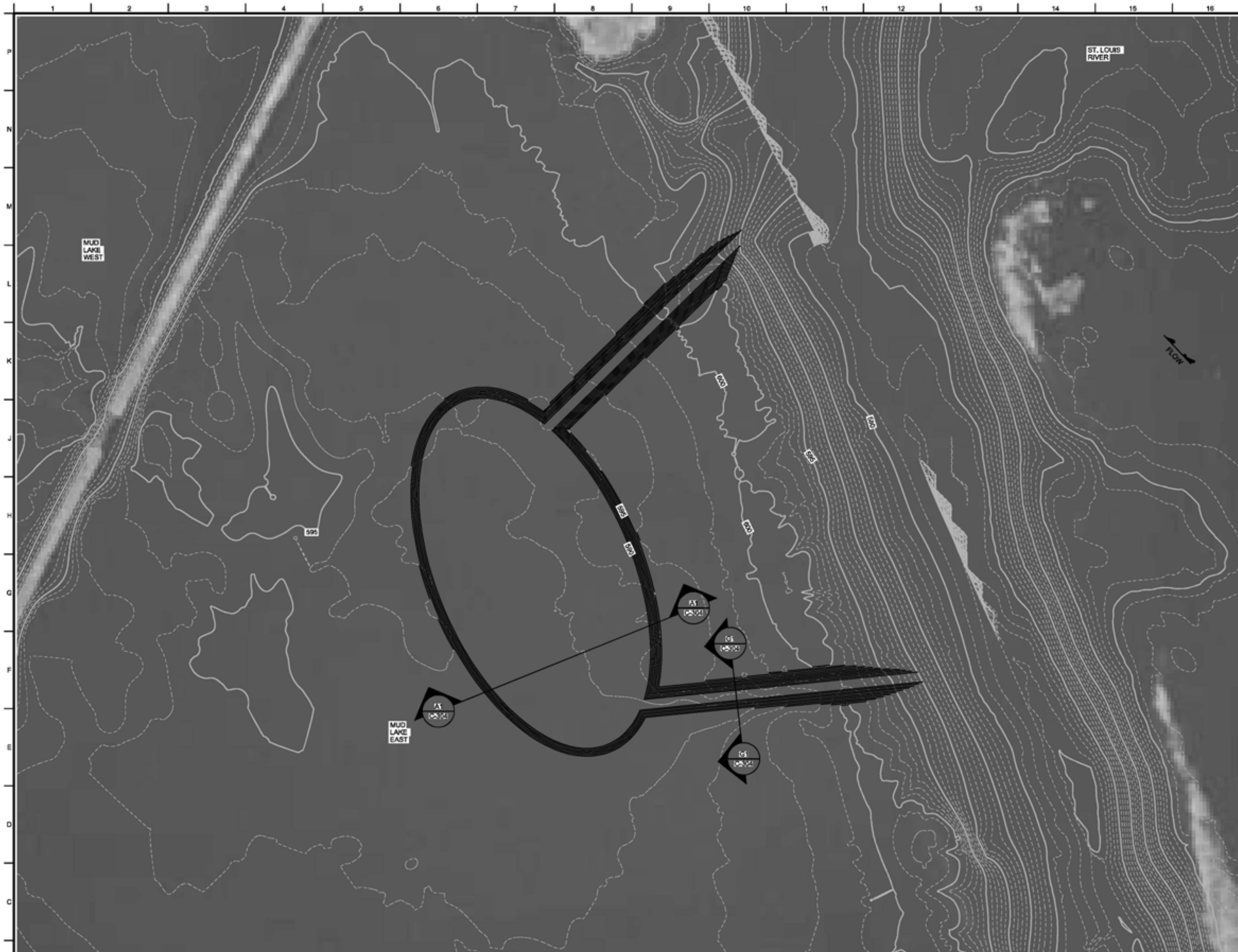
C-107

65% BCOES REVIEW

FY21 Mud Lake RAP_C-107.dgn DS:

PD:

8:44:18 AM 7/12/2024



A1 REQUIRED DEEPWATER PLAN VIEW

SCALE: 1"=100'

0 100' 200'

GENERAL SHEET NOTES

1.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

DESIGNED BY: E. MALBURG	ISSUE DATE: 12JULY2024
DRAWN BY: K. VINCENT	SOLICITATION NO.: W911XK
CHECKED BY: T. SMITH	CONTRACT NO.: W911XK
SUBMITTED BY: PHILL ROSS	
SIZE: ANSI D	FY21 Mud Lake RAP_C-108.dgn

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED DEEP WATER DREDGE
PLAN VIEW

SHEET ID
C-108

65% BCOES REVIEW

FY21 Mud Lake RAP_C-108.dgn DS:
PD:
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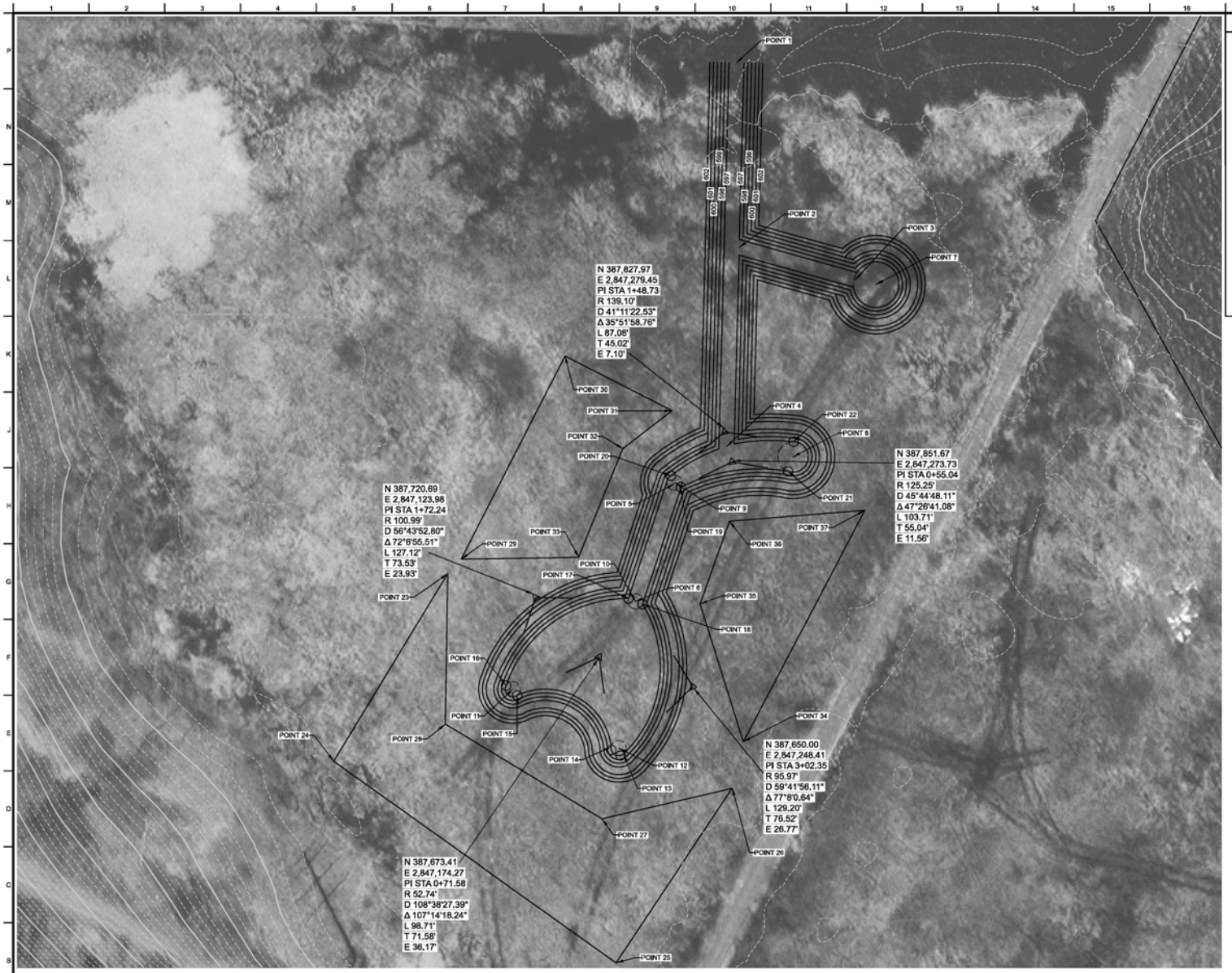

A1 REQUIRED HEMI-MARSH PLAN VIEW - SOUTHWEST
SCALE: 1"=50'

0 50' 100'

GENERAL SHEET NOTES

1.

POINT	X	Y
1	2847283.001	388143.882
2	2847285.255	387997.870
3	2847377.048	387972.178
4	2847275.189	387840.133
5	2847233.623	387810.455
6	2847203.086	387717.638
7	2847393.574	387968.333
8	2847327.853	387831.819
9	2847234.000	387811.601
10	2847203.086	387717.638
11	2847105.905	387648.115
12	2847189.778	387601.394
13	2847193.514	387596.700
14	2847183.891	387602.550
15	2847109.432	387643.244
16	2847100.675	387651.054
17	2847197.514	387719.902
18	2847208.665	387715.396
19	2847239.217	387808.059
20	2847229.136	387815.114
21	2847323.883	387820.495
22	2847328.409	387843.806
23	2847054.323	387739.532
24	2846964.081	387591.009
25	2847187.725	387431.485
26	2847279.637	387569.518
27	2847176.625	387545.389
28	2847052.576	387620.412
29	2847064.970	387751.013
30	2847147.278	387911.834
31	2847231.988	387868.480
32	2847193.049	387838.400
33	2847158.080	387752.399
34	2847288.332	387606.475
35	2847254.126	387715.510
36	2847277.407	387780.884
37	2847384.644	387789.578

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: E. MAHLBERG
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PAELL HOSS
DATE: ANSI D
ISSUE DATE: ISSUE DATA
SOLICITATION NO.: W911XK
CONTRACT NO.: W911XK
FY21 Mud Lake RAP_C-109.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED HEMI-MARSH
PLAN VIEW - SOUTHWEST

SHEET ID
C-109

65% BCOES REVIEW

PW:
FY21 Mud Lake RAP_C-109.dgn
DS:
8:45:47 AM 7/12/2024

GENERAL SHEET NOTES

1.

A1 REQUIRED HEMI-MARSH PLAN VIEW - SOUTHEAST
SCALE: 1"=60'

0 60' 120'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

DESIGNED BY:	ISSUE DATE:
E. MAHLBERG	ISSUE PHASE:
DRAWN BY:	SOLICITATION NO.:
K. VINCENT	W911KK
CHECKED BY:	CONTRACT NO.:
T. SMITH	W911KK
SUBMITTED BY:	
PHILL ROSS	
FILE:	
ANSI D	FY21 Mud Lake RAP_C-110.dgn

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED HEMI-MARSH
PLAN VIEW - SOUTHEAST

SHEET ID
C-110

65% BCOES REVIEW

PDF:
FY21 Mud Lake RAP_C-110.dgn
DS:
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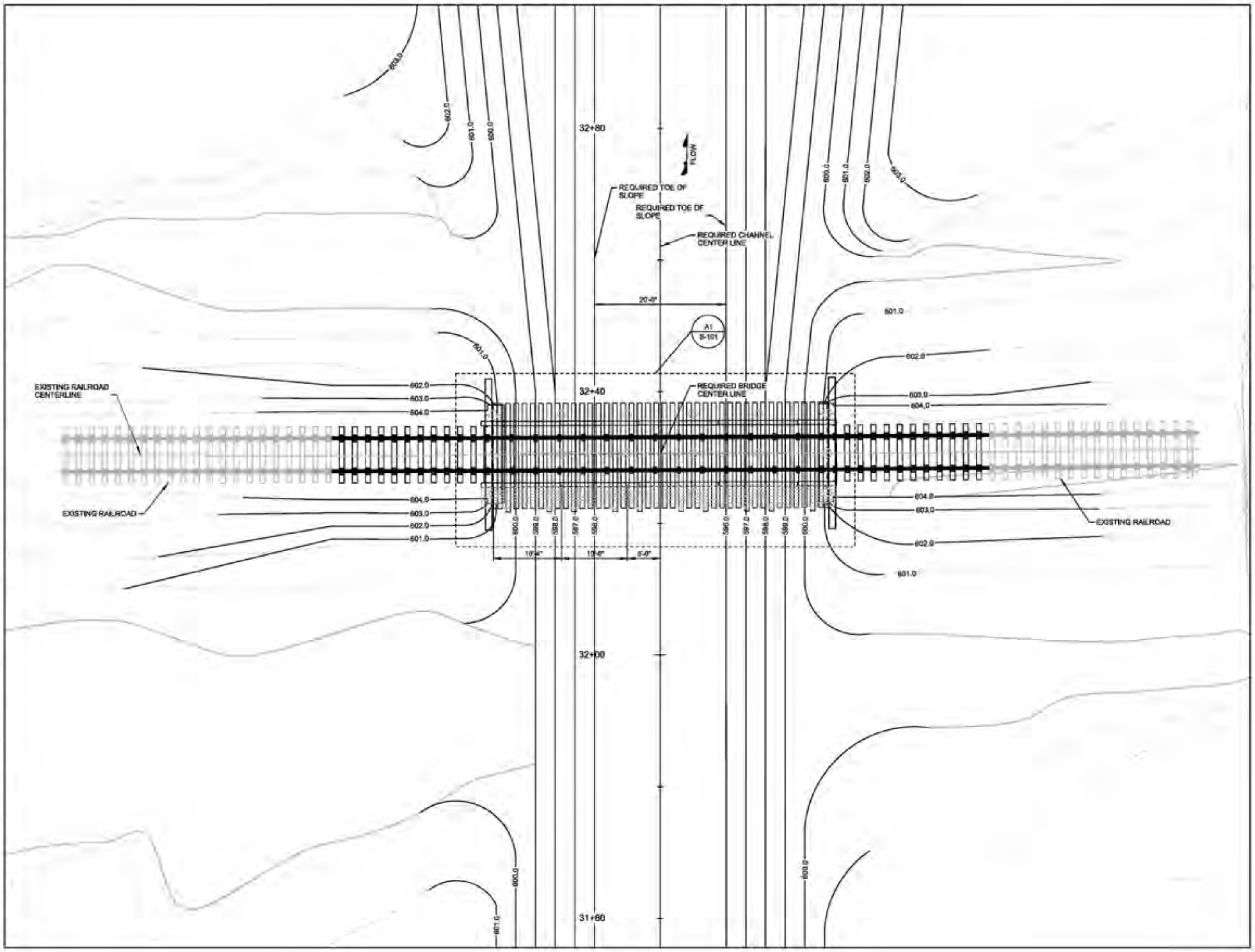


A1 REQUIRED GRADING NEAR RAILROAD PLAN VIEW

SCALE: 1/8"=10'

GENERAL SHEET NOTES

1.

LEGEND

	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
635.0	MAJOR CONTOUR
	MINOR CONTOUR

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: H. BASHORE
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PHILL ROSS
SIZE: ANSI D
ISSUE DATE: 12/JULY/2024
SOLICITATION NO.: W911XK
CONTRACT NO.: W911XK
FY21 Mud Lake RAP_C-111.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED GRADING
RAILROAD AREA

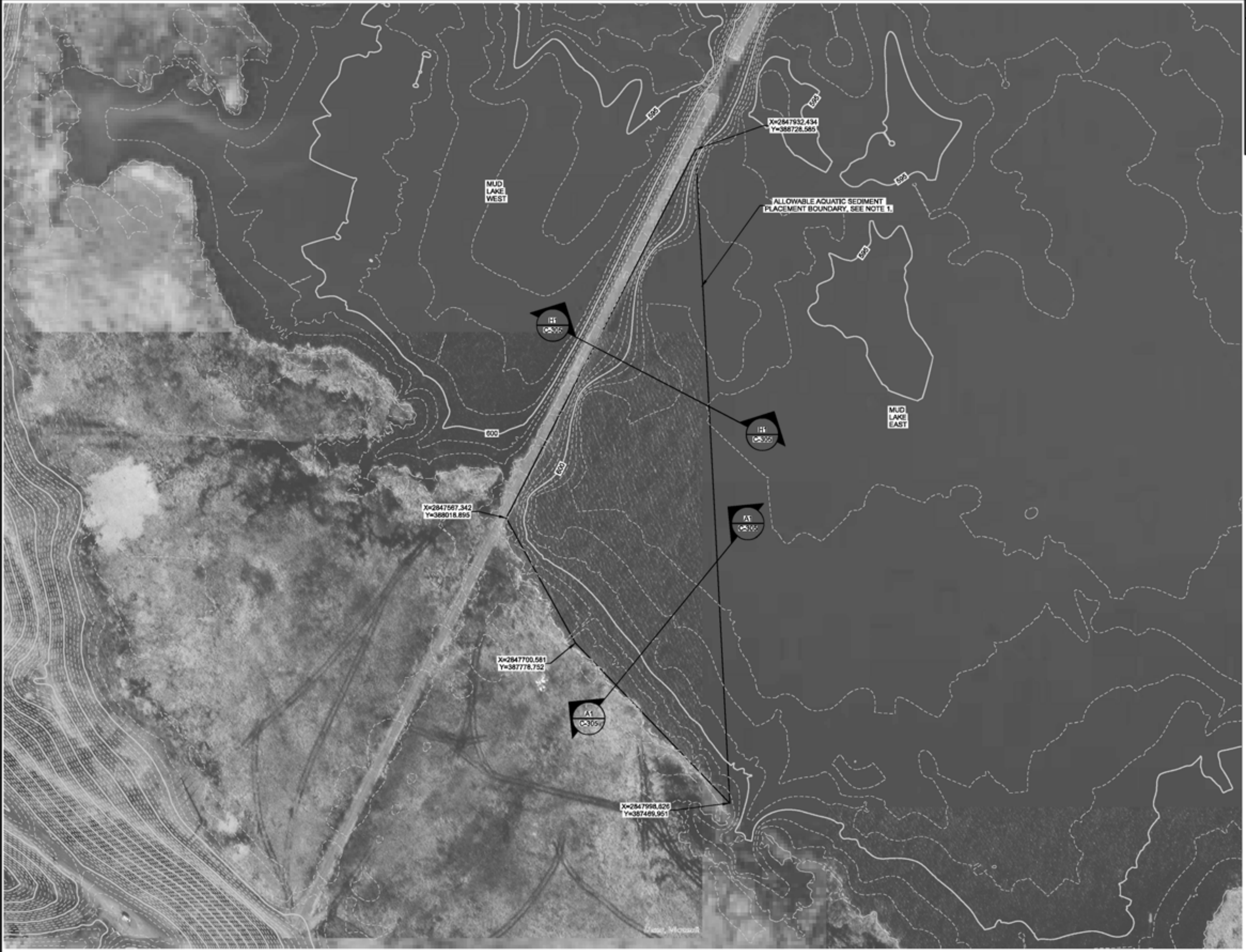
SHEET ID
C-111

65% BCOES REVIEW

FY21 Mud Lake RAP_C-111.dgn
PD:
8:47:27 AM 7/12/2024

GENERAL SHEET NOTES

1. SEE SPECIFICATION SECTION 35 20 23 DREDGING FOR AQUATIC PLACEMENT REQUIREMENTS.



A1 REQUIRED WETLAND - PLACEMENT PLAN

SCALE: 1"=100'

0 100' 200'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

DESIGNED BY: H. BASHORE	ISSUE DATE: 12JULY2024
DRAWN BY: K. VINCENT	SOLICITATION NO.: W911XK
CHECKED BY: T. SMITH	CONTRACT NO.: W911XK
SUBMITTED BY: PHILL ROSS	
SIZE: ANSI D	FY21 Mud Lake RAP_C-112.dgn

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED WETLAND - PLACEMENT PLAN

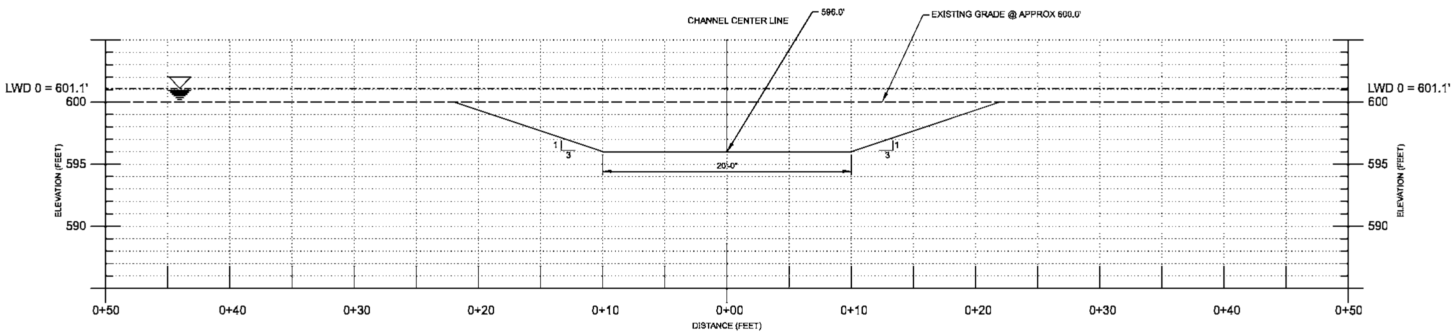
SHEET ID

C-112

65% BCOES REVIEW

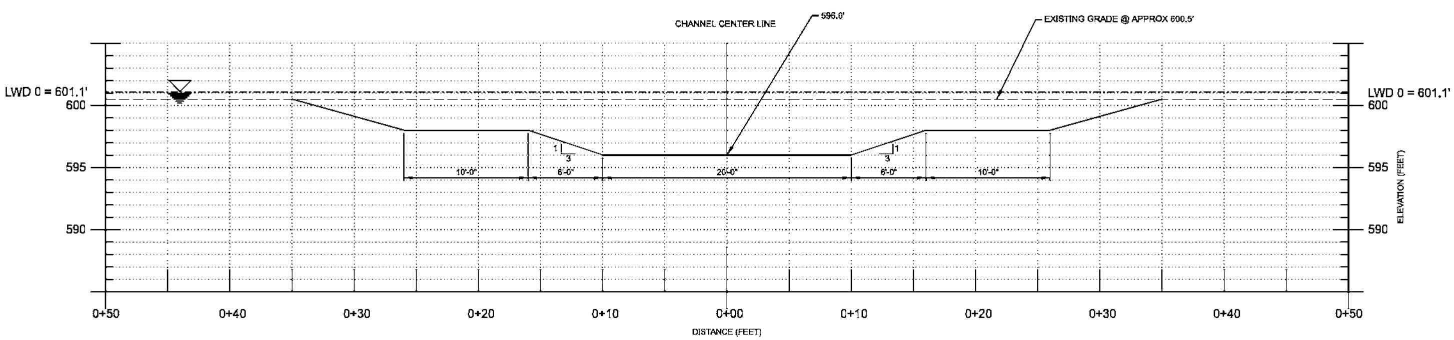
FY21 Mud Lake RAP_C-112.dgn

8:48:08 AM 7/12/2024



G1 TYPICAL CHANNEL CROSS SECTION: STA 0+00 TO STA 11+72 AND STA 30+80 TO STA 38+62.47

SCALE: 1"=5'



A1 TYPICAL CHANNEL CROSS SECTION: STA 11+72 TO STA 30+80

SCALE: 1"=5'

GENERAL SHEET NOTES

1. NOTE 1
2. NOTE 2
3. NOTE 3

SHEET LEGEND

- EXISTING LAKE BOTTOM
- CHANNEL BOTTOM
- LWD

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: E. MALBURG
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PHIL ROSS
SIZE: ANSI D
ISSUE DATE: 12JULY2024
SOLICITATION NO.: W911XX
CONTRACT NO.: W911XX
FY21 Mud Lake RAP_C-301.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED CHANNEL CROSS SECTIONS

SHEET ID

C-301

65% BCOES REVIEW

FY21 Mud Lake RAP_C-301.dgn DS:
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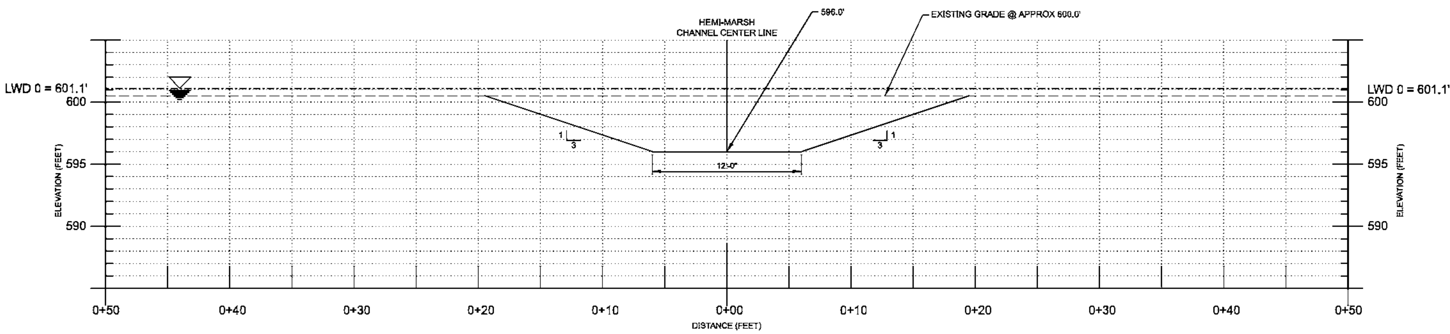
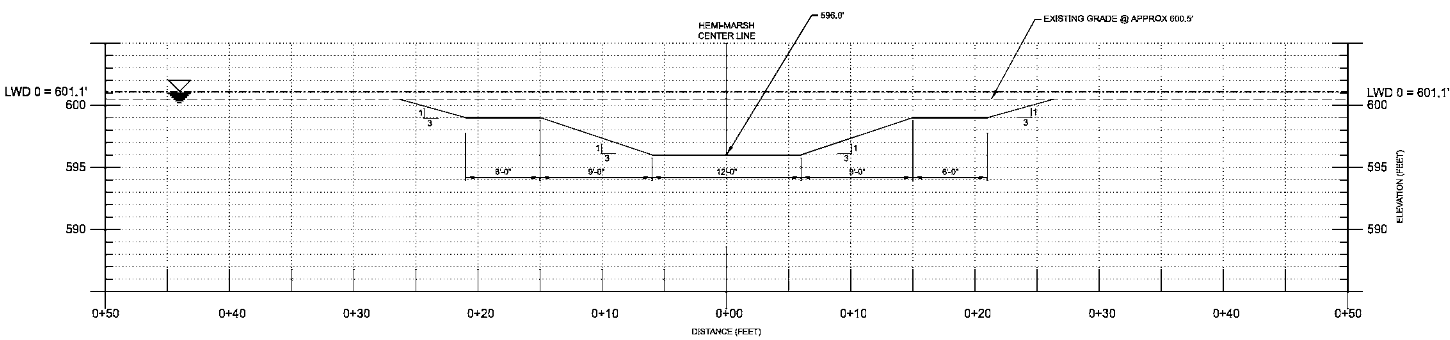


TYPICAL HEMI-MARSH CHANNEL CROSS SECTION - CHANNEL

G1 (A1 / C-101)

SCALE: 1"=5'



TYPICAL HEMI-MARSH CROSS SECTION - CHANNEL

A1 (A1 / C-101)

SCALE: 1"=5'

GENERAL SHEET NOTES

1. NOTE 1
2. NOTE 2
3. NOTE 3

SHEET LEGEND

- - - - - -	EXISTING LAKE BOTTOM
————	CHANNEL BOTTOM
-·-▽-·-	LWD

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: E. MALBURG
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PHILL ROSS
SIZE: ANSI D
ISSUE DATE: 12JULY2024
SOLICITATION NO.: W911XK
CONTRACT NO.: W911XK
FY21 Mud Lake RAP_C-302.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

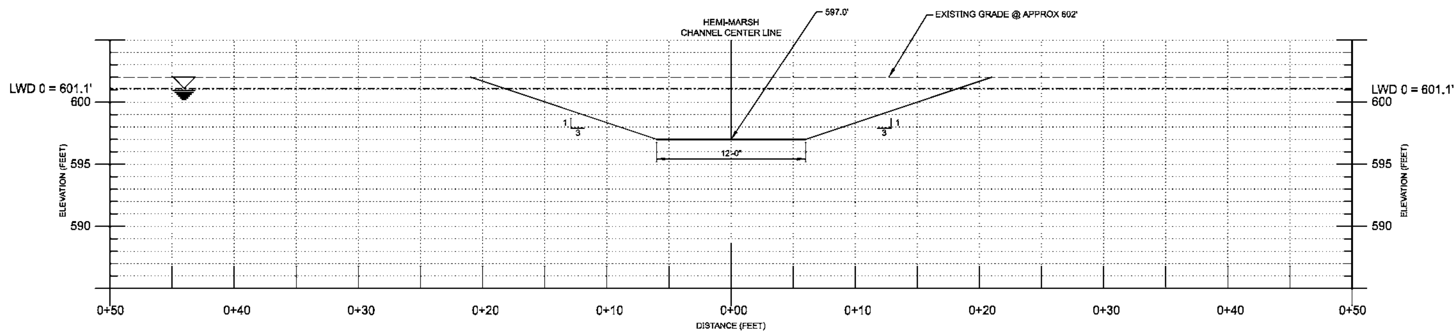
REQUIRED HEMI-MARSH
CROSS SECTIONS - CHANNEL

SHEET ID

C-302

65% BCOES REVIEW

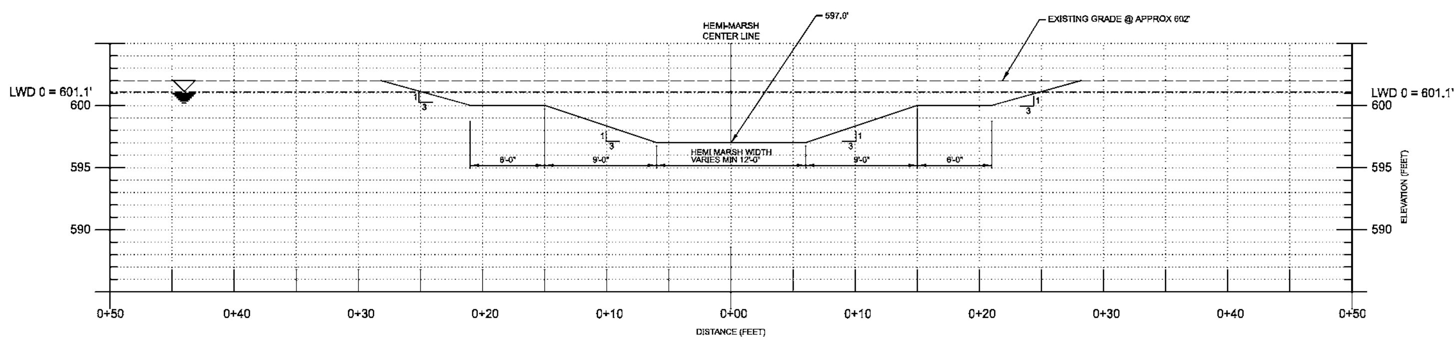
FY21 Mud Lake RAP_C-302.dgn
DS:
PD:
8:49:35 AM 7/12/2024



TYPICAL HEMI-MARSH CHANNEL CROSS SECTION

G1 — A1 / C-101

SCALE: 1"=5'



TYPICAL HEMI-MARSH CROSS SECTION

A1 — A1 / C-101

SCALE: 1"=5'

GENERAL SHEET NOTES

1. NOTE 1
2. NOTE 2
3. NOTE 3

SHEET LEGEND

Symbol	Description
- - - - - -	EXISTING LAKE BOTTOM
———	CHANNEL BOTTOM
-·-▽-·-	LWD

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: E. MALBURG
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PHIL ROSS
SIZE: ANSI D
ISSUE DATE: 12JULY2024
SOLICITATION NO.: W911XX
CONTRACT NO.: W911XX
FY21 Mud Lake RAP_C-303.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

REQUIRED HEMI-MARSH
CROSS SECTIONS - SOUTH

SHEET ID
C-303

65% BCOES REVIEW

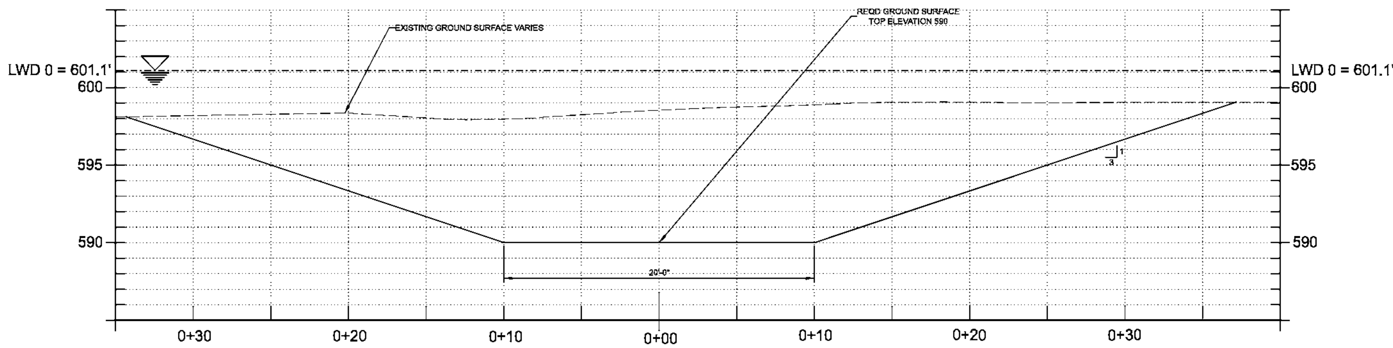
FY21 Mud Lake RAP_C-303.dgn DS:
PD:
8:50:15 AM 7/12/2024

GENERAL SHEET NOTES

1. NOTE 1
2. NOTE 2
3. NOTE 3

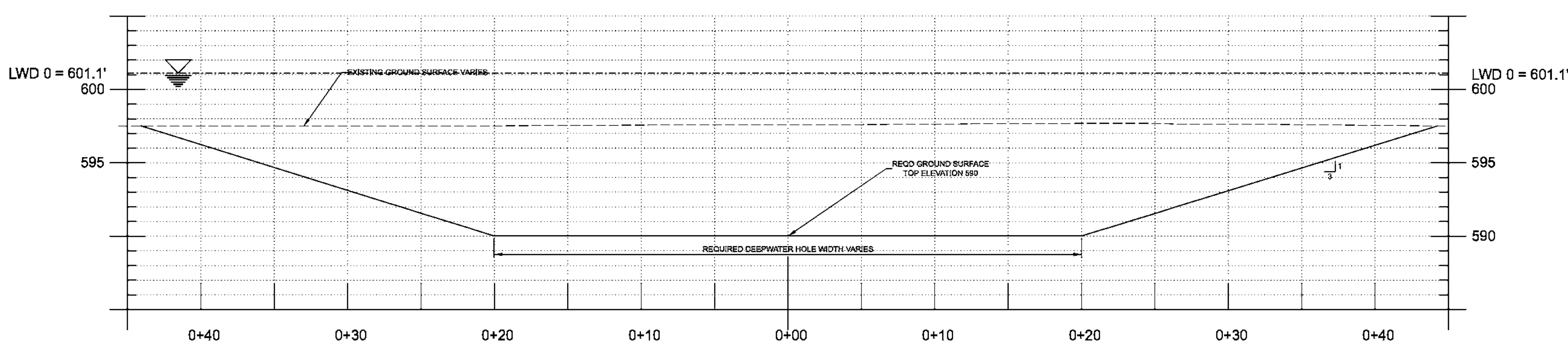
SHEET LEGEND

- EXISTING LAKE BOTTOM
- REQD DREDGING
- LWD



G1 (A1 / C-108) TYPICAL DEEP WATER CHANNEL DREDGING CROSS SECTION

SCALE: 1/4"=1'



A1 (A1 / C-108) TYPICAL DEEP WATER DREDGING CROSS SECTION

SCALE: 1/4"=1'

US Army Corps of Engineers®

MARK | DESCRIPTION | DATE

DESIGNED BY: E. MALBURG
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PHIL ROSS
SIZE: ANSI D

ISSUE DATE: 12JULY2024
SOLICITATION NO.: W911XX
CONTRACT NO.: W911XX

FY21 Mud Lake RAP_C-304.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

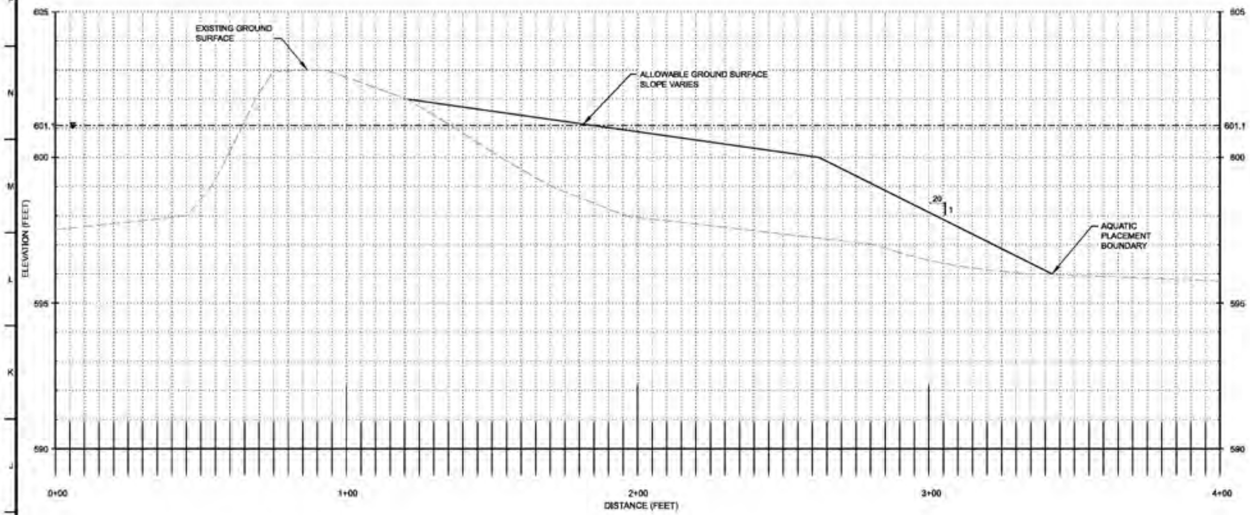
REQUIRED DEEP WATER CROSS SECTIONS

SHEET ID

C-304

65% BCOES REVIEW

FY21 Mud Lake RAP_C-304.dgn DS:
PD:
8:50:53 AM 7/12/2024

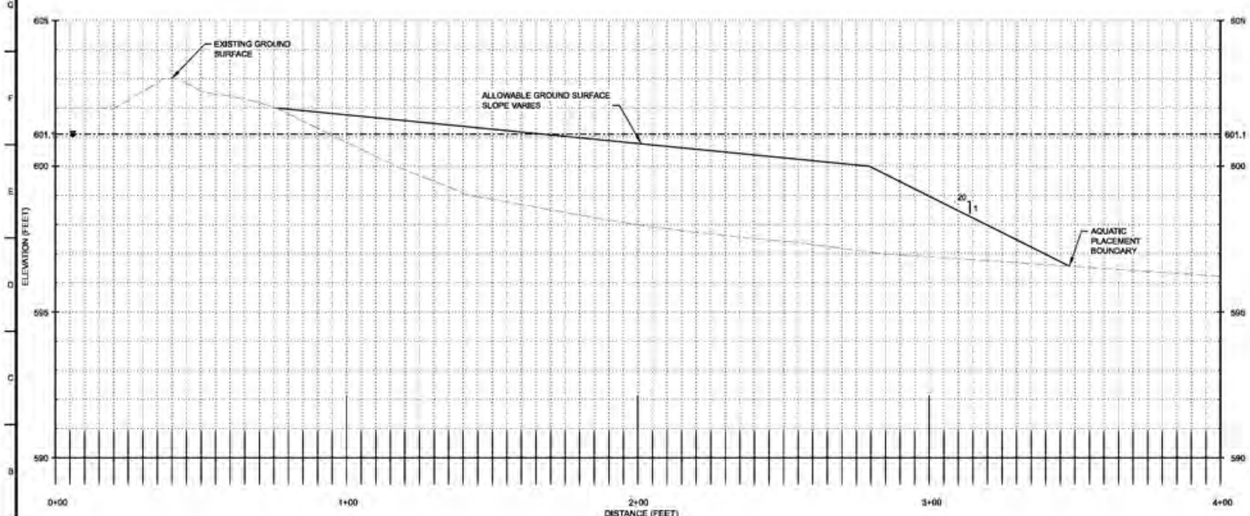


H1 PLACEMENT AREA CROSS SECTION

A1 / C-112

SCALE: 3/64"=1'

0 16' 32' 64'



A1 PLACEMENT AREA CROSS SECTION

A1 / C-112

SCALE: 3/64"=1'

0 16' 32' 64'

GENERAL NOTES

1.

LEGEND

————	PROPOSED GROUND
— — — —	EXISTING GROUND
—·—·—·—	LWD

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: E. MALBURG
DRAWN BY: K. VINCENT
CHECKED BY: T. SMITH
SUBMITTED BY: PHIL ROSS
SIZE: ANSI D

ISSUE DATE: 12/JULY/2024
SOLICITATION NO.: W911XX
CONTRACT NO.: W911XX

FILE NAME: FY21 Mud Lake RAP_C-305.dgn

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

PLACEMENT AREA
CROSS SECTIONS

SHEET ID

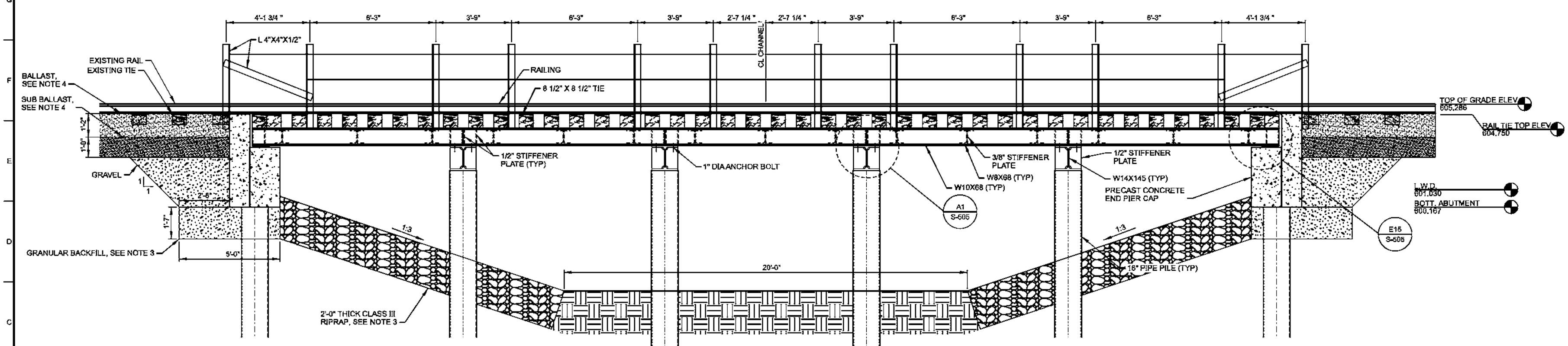
C-305

65% BCOES REVIEW

FY21 Mud Lake RAP_C-305.dgn
8:51:35 AM 7/12/2024

GENERAL SHEET NOTES

1. REUSE EXISTING RAIL AND TIMBER RAIL TIES UNLESS DAMAGE NOTED TO EXISTING.
2. LIMIT EXCAVATION FOOTPRINT TO PROPERLY PLACE REQUIRED RIPRAP AND BASE COURSE. TRACK SHALL BE REMOVED AT EXISTING BREAK BEYOND THE LIMIT OF EXCAVATION. CARE SHOULD BE TAKEN NOT TO DAMAGE EXISTING TRACK AND TIES.
3. FOR REQUIREMENTS OF RIPRAP AND GRANULAR BACKFILL, SEE SPEC SECTION 35 42 37.00 06.
4. FOR REQUIREMENTS OF BALLAST AND SUB-BALLAST, SEE SPEC SECTION 34 11 00.
5. FOR GENERAL EARTHWORK, EXCAVATION AND FILL MATERIALS, SEE SPEC SECTION 31 00 00.00 06.



A1 S-101 (A1) SECTION - MIDDLE SECTION
SCALE: 3/8"=1'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT
477 MICHIGAN AVE
DETROIT, MI 48226

DESIGNED BY: J. CARR	ISSUE DATE: 12JULY2024
DRAWN BY: M. ASKAR	SOLICITATION NO.: W911XK
CHECKED BY: T. SMITH	CONTRACT NO.: W911XK
SUBMITTED BY: PHILL ROSS	
SIZE: ANSI D	FY21 Mud Lake RAP_S-301.dgn

ST. LOUIS COUNTY
DULUTH, MN
MUD LAKE RAP

DECK BRIDGE CROSS SECTION

SHEET ID
S-301

65% BCOES REVIEW

FY21 Mud Lake RAP_S-301.dgn
DS:
PD:
8:54:16 AM 7/12/2024

Attachment 3

SUBJECT: Wetland and Waterbody Delineation for Mud Lake, St. Louis County, MN, on behalf of the Detroit District USACE

1. Introduction

The U.S. Army Corps of Engineers (USACE), St. Paul District Regulatory Branch conducted a wetland delineation on behalf of the Detroit District Planning Branch for a project area adjacent to the St. Louis River in St. Louis County, Minnesota at Mud Lake. The purpose of this memorandum is to document the methods used and conclusions made regarding the extent of wetlands present at the Mud Lake site.

The area of investigation (AOI) for the Mud Lake site encompasses approximately 300 acres as shown on Figure 1 (Appendix A), and is located in Section 2 & 11, Township 48 North, Range 15 West, St. Louis County, Minnesota.

2. Methods and Materials

The wetland delineation was conducted using a combination of on-site and off-site methods detailed below.

On-site procedures were conducted in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual (Corps Manual)* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North Central and Northeast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010). Identification and evaluation of waterbodies within the project area, including streams, was conducted in accordance with *Regulatory Guidance Letter 05-05: Determining the Ordinary High Water Mark.*

The Corps staff team conducted the on-site data collection on August 22, 2022. Off-site wetland determination methods using aerial photography and elevation data, coupled with field verification, were employed to determine the extent of wetlands and waterbodies in areas where access was not permitted or not accessible.

The following resources were utilized for the wetland delineation:

- Google Earth Pro (version 7.3.3.7786) 1991, 2003, 2004, 2006, 2008, 2009, 2011, 2012, 2015, 2016, 2017, 2021 true color aerial photographs;
- ArcGIS Pro 2.7.1
- National Wetlands Inventory (NWI) mapping;
- MN Department of Natural Resources (DNR) Public Waters Inventory;
- USGS National Hydrography Dataset (NHD)
- USDA Web Soil Survey digital soil mapping;
- St. Louis County LiDAR data

In addition, the following methods were used:
a. Placing Observations of Hydrology in the Context of Antecedent Precipitation. *Hydrology Tools for Wetland Determination (Woodward et al. 1997) and Assessing and Using Meteorological Data to Evaluate Wetland Hydrology (Sprecher and Warne 2000)* recommend evaluation of precipitation for the 3 months prior to the date of the aerial imagery to assist in making determinations regarding signatures noted on aerial photography. The USACE Antecedent Precipitation Tool (APT) was used to determine antecedent precipitation for the date of the site visit. Direct observations of hydrology

indicators made during the site visit were then placed in the context of antecedent precipitation.

3. Landscape and Soils

The Mud Lake site is situated along the Minnesota side of the St. Louis River. The site is located within the Glacial Lake Superior Plain Subsection of the Laurentian Mixed Forest Province, as described in accordance with the MN DNR Ecological Classification System. Much of the site has been impacted by development and industrialization over several decades which has lead to soil contamination. The north, west, and south edges of the site have been partially developed for an abandoned industrial site and a railroad grade that travels along the southwest and south property border. An abandoned railroad track also crosses the middle of the open water portion of the AOI aligned northeast to southwest. The western and northwestern portions of the site abut an overhead utility corridor and an abandoned industrial facility that displays evidence of land disturbance throughout the years. Native soils consist of clay, sand, and organics. Soils mapped within the AOI are listed in the table below and shown on Figure 6 of Appendix A.

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1020A	Bowstring and Fluvaquents, loamy, 0 to 2 percent slopes, frequently flooded	213.7	10.9%
1026A	Udifluvents, loamy, 0 to 2 percent slopes, occasionally flooded	12.1	0.6%
E3B	Cuttre complex, 0 to 8 percent slopes	16.3	0.8%
E18A	Urban land-Cuttre-Rock outcrop complex, 0 to 3 percent slopes	486.2	24.7%
E23F	Miskoaki-Udifluvents, flooded, complex, 1 to 45 percent slopes	1.6	0.1%
E24F	Miskoaki-Cuttre complex, 5 to 45 percent slopes	79.1	4.0%
W	Water	269.8	13.7%
Subtotals for Soil Survey Area		**1,078.7**	**54.9%**

Totals for Area of Interest	**1,966.1**	**100.0%**

4. Results and Conclusion

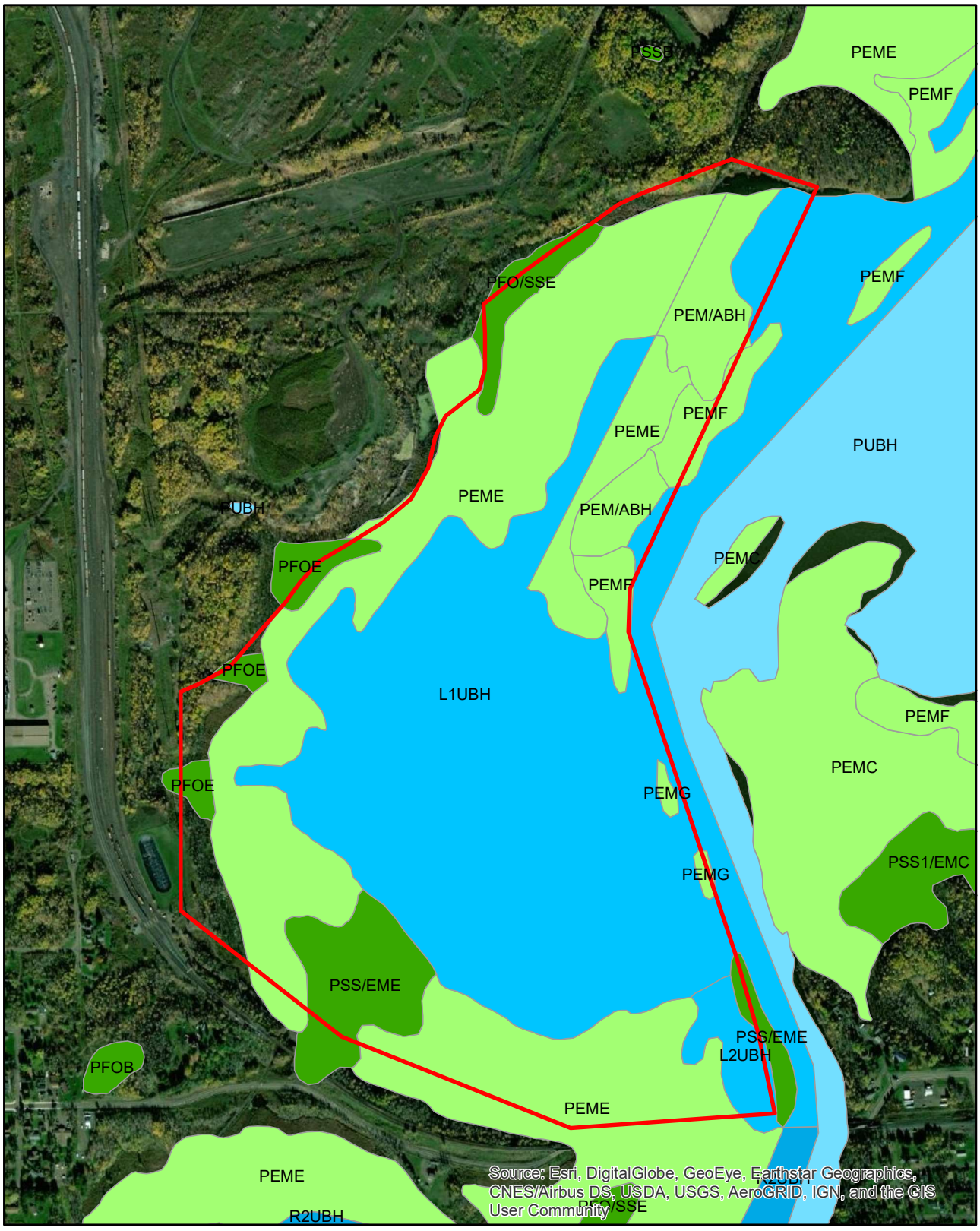
The area of interest was visited by Corps personnel on 22 August 2022. Weather at the time of visit was sunny. An antecedent precipitation curve for the prior three months show that the location of the study was drier than normal. For the 30 days ending 23 June 2022, the wetness condition was normal. For the 30 days ending 23 July 2022, the wetness condition was dry. For the 30 days ending 22 August 2022, the wetness condition was dry. The drought index (PDSI) for the observation point was moderately wet for the observation period. The discrepancy between the observation that the site was drier than normal and the drought index as moderately wet was probably due to excessive precipitation from March to early June. Despite drier than normal conditions at this site, there didn't appear to be any constraints on the ability to conduct a wetland delineation.

Vegetation at the site was moderately disturbed, however a relatively diverse plant community allowed for an adequate representation of vegetation that included both upland and wetland plant communities.

Due to challenging terrain and difficult access at much of the site north of the railroad bridge, the decision was made to sample vegetation and soils at two representative sites and determine if these points were located at a similar elevation. The far northern end of the review area contains a superfund remediation site which was not accessed due to active remediation efforts and potential exposure to hazardous materials.

The attached wetland delineation map shows the results of the delineation effort at this site. The points selected were adequate to delineate the elevation of the wetland at the margin of Mud Lake. At the locations reviewed there was a relatively sharp difference in elevation from upland to the water surface which resulted in a narrow margin between upland and wetland. The elevation difference on the north end was large. On the south end, the elevation difference between upland and the water surface was smaller, but the gradient was nonetheless sharp which resulted in a narrow band between wetland and upland. This gradient is shown graphically in the delineation map as a narrow band of wetland between the upland and open water.

Mud Lake Wetland Delineation Boundary



0 0.075 0.15 0.3 Miles

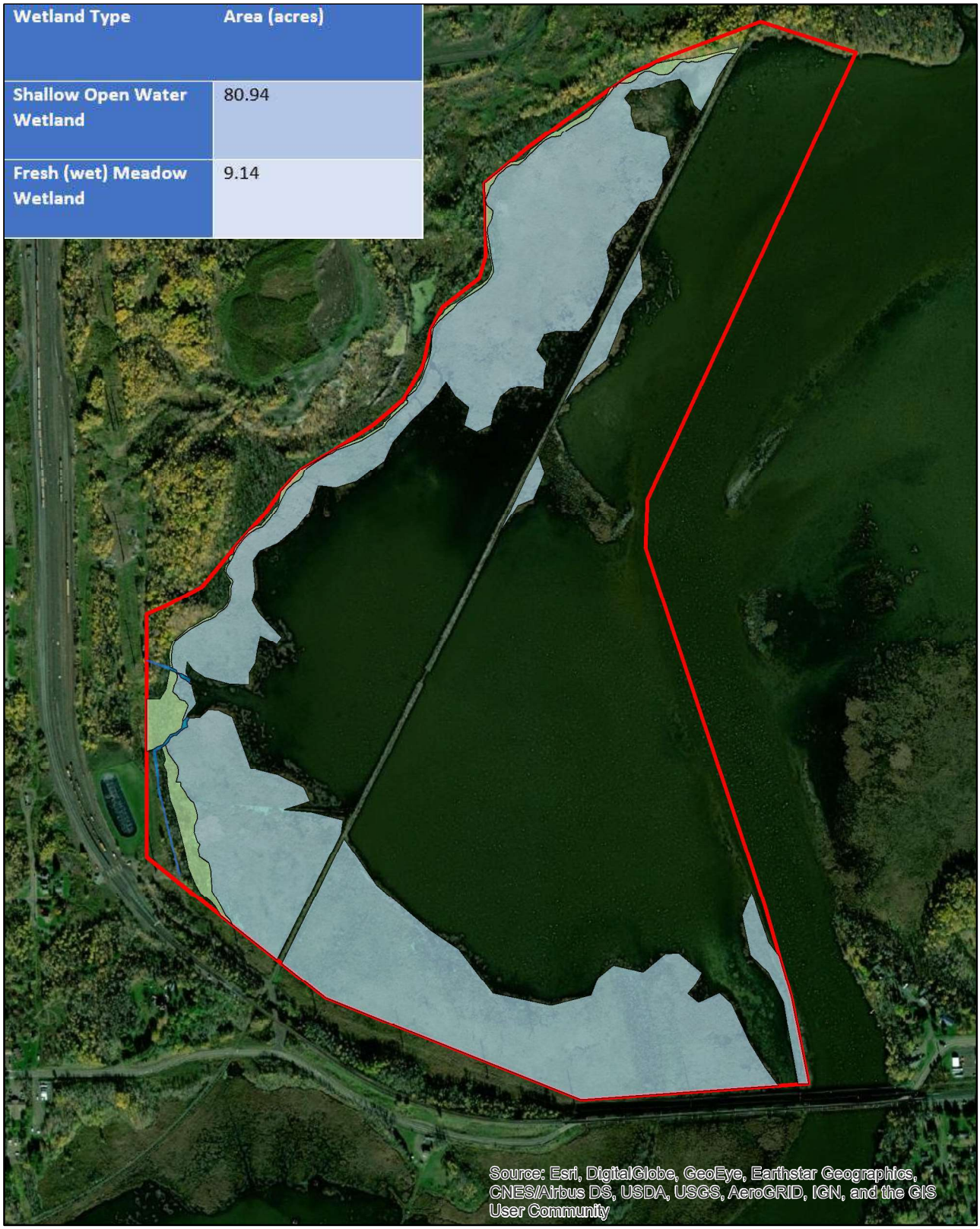
N

Legend

- Mud Lake Delineation Boundary
- **Wetlands (NWI)**
- **Representation: NWI_MN_Rep**
- Other
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

Mud Lake Wetland Delineation

Wetland Type	Area (acres)
Shallow Open Water Wetland	80.94
Fresh (wet) Meadow Wetland	9.14



0 0.05 0.1 0.2 Miles

N

Legend

- Shallow Open Water Wetland
- Wetland
- Stream
- Mud Lake Delineation Boundary